HAM RADIO OUTLET®

SPRING / SUMMER 1994

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Now Open in Newcastle, Delaware

Communication Equipment Catalog

Extend Your Horizons in Amateur Radio

KENWOOD
50MHz ALL MODE TRANSCEIVER TS-60
KENWOOD
HF TRANSCEIVER TS-50

Kenwood's New TS-60S and TS-50S
See page 20

HRO's 1993 Best Sellers*

TH-28A

TM-241A

TM-732A

TS-450S

*See Page 26

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Maps 120-121 • Index 122

DEMAND THE BEST

Channel Scope

DR-600T (144 MHz/440 MHz)

The outstanding abilities of the DR-600T set it apart from every other radio. Features like Wide Frequency Coverage, Excellent Intermod Rejection, Direct Frequency Entry from the microphone, Three Output Power Selections, Autopatch Memories, and 6 Scanning Modes make the DR-600T the radio of choice for demanding users. The Remote Mount Head allows for custom installation in most any vehicle, and also helps to deter theft.

This road-ready rig can also be remote controlled by any radio that transmits DTMF tones. This remarkable feature allows the DR-600T to act as a full-featured Cross-Band Repeater. For added control, a security code can be programmed that will allow control only by the control operator (you).

DJ-G1T

The DJ-G1T 2m HI from ALINCO scores another "First" for Amateur Radio technology. Our new "Channel Scope" feature opens new doors for Ham operators. Now it is possible to visually monitor up to 7 memory channels at once with just a glance at the display.

Also, the Channel Scope feature can be used to show band activity in the frequency domain, much like a Digital Spectrum Analyzer. Hunting for band activity just got easier.

Other outstanding features include 440 Receive, 80 Memory channels, AM Aircraft receive, 5 Autodialer channels, DSQ for private paging, Cross-Band Semi-Duplex, 6 Scan Modes, and Odd Splits on all Memory Channels.

Better Products, Better Service. See for yourself why people are coming to ALINCO.

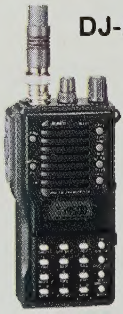
ALINCO
ELECTRONICS INC.

438 Amapola Ave., #130,
Torrance, CA 90501
Phone: (310) 618-8616

— Other Great Products from ALINCO —

DJ-580T

DJ-F1T



DR-130T

DJ-180T

DJ-180T

$244.95

DJ-180T-HP

$285.95

Suggested List Prices—Call for Quotes

2 Meter Handhelds

Just when you thought great audio and tough-as-nails construction were luxury features available only on the most expensive models, and just when you thought simple, intuitive operation was a thing of the past, along comes the Alinco DJ-180T.

This tiny, handheld transceiver now offers 5 watts output. The command keys are laid out so you will not have to spend hours studying the manual. You don't need a magnifying glass to see the large 16 digit DTMF pad and highly-visible illuminated LCD display.

Features include:

- Expandable memory. The DJ-180T comes standard with ten memory channels including one call channel. It can be upgraded to 50 or 200 memory channels with the optional EJ-14U (50 channels) or EJ-15U (200 channels).
- Odd repeater offsets can be programmed from 0 to 15.998 MHz in 5 kHz steps. A different repeater offset can be stored in each memory channel.
- Memory features include storage of repeater offset, shift direction, CTCSS encode, and tone squelch.
- Two watts power output is standard. Up to 5 watts is available with optional 12 VDC battery packs.
- Automatic power-off function allows the DJ-180T to be programmed to shut itself off when left dormant for a predetermined time.
- A full range speaker and crisp clean audio circuitry combine to bring you unbelievably great sound.
- The standard battery is a 7.2 volt 700 mAh rechargeable NiCd battery. The unit comes with a wall charger.
- A low battery indicator LCD lets you know when it is time to recharge your NiCd.
- Enjoy extended receive frequency coverage 130-173.995 MHz.

DJ-G1T

$409.95

Suggested List Prices
Call for Quote

NEW!

2 Meter Transceiver Receives 440 MHz

Alinco Scores Another First! A Built-in Spectrum Analyzer

Finally. A new feature that is really useful!

Alinco's newest 2-meter HT, the DJ-G1T, offers the new "Channel Scope" built-in Spectrum Analyzer. This remarkable feature lets you visually monitor band activity, much like a commercial Digital Spectrum Analyzer.

The oversized display shows seven bar graphs, each of which can be assigned to an independent memory channel. This lets you monitor activity on seven different memory channels simultaneously, and instantly, with just a glance at the display. If one or more memory channels become active, the corresponding bar graph lets you know and also gives you information on apparent signal strength.

Outstanding features include:

- 440 MHz receive and AM aircraft receive.
- 80 memory channels with 5 autodialer memories.
- Programmable delay for autodialer.
- DSQ for Private Paging.
- Exceptional audio quality (True FM).
- Cross-Band Semi Duplex.
- CTCSS Encode built-in.
- 6 Scan Modes.
- Odd-Splits on all memory channels.
- Shows band activity in frequency domain in 5, 10, 12.5, 15, 20, 25, 30 or 50 kHz steps.

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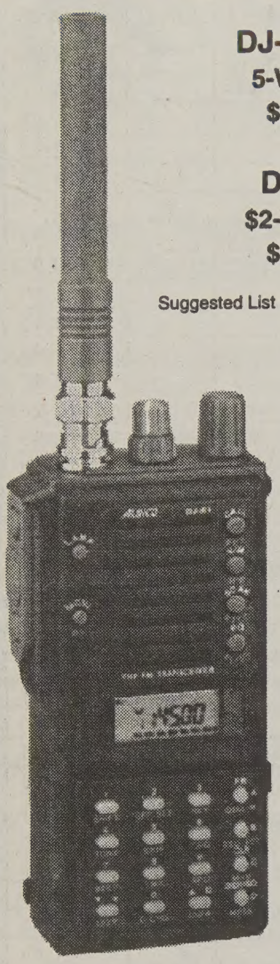
ALINCO
ALINCO ELECTRONICS INC.



DJ-F1T-TH

5-Watt 2m

$334.95

DJ-F1T

$2-Watt 2m

$309.95

Suggested List Prices—Call for Quotes

Features include:

- Wide band receiver 140-170 MHz (AM 118-136 MHz with mod).
- Digital frequency display and memory function.
- Pager and DTMF code squelch.
- Full 5 watts output. (Also available in a 2-watt version: the DJ-F1T.)
- 40 memory channels store frequency, shift, split, tone information, offset, DSQ setting.
- 8 scan modes, dual watch and priority.
- Six channel steps: 5, 10, 12.5, 15, 20 & 25 kHz.
- Programmable VFO range function.

Alinco's 2-meter compact hand-helds are super small but packed with features. Choose either the 2-Watt or 5-Watt model.

Dual Band Handheld

DJ-580T

$499.95

Suggested List Price—Call for Quote

Alinco has an outstanding dual-band handheld transceiver covering 2 meters and 440 MHz. Most features are standard.

This super compact, affordable HT gives you plenty of power and great audio.

Major features include:

- 2 watts output on 2m & 70cm. 5W with the optional EBP-22 battery.
- Built-in CTCSS encoder / decoder.
- Full-duplex, cross-band repeater capability.
- 40 memory channels (any combination of VHF and UHF).
- Separate volume and squelch controls for each band.
- Back-lit keypad.
- Receives 118-174 & 410-470 MHz.
- Easily modified for MARS and CAP operation (proper license required).

Call Toll Free to Order Your Alinco Radio

Alinco Handheld Specifications

Model	Type	Frequency Range	Power	Current Drain Xmit	Current Drain Rec	Power Out **	Memories	Ant Z	Mike Z	Sensivity	Height in	Width in	Depth in	Weight lbs
DJ-G1T	Handheld	2 m	13.8 VDC	1.6 A	120 mA	5 W	80	50 Ω	2k Ω	<.15 µV at 12 dB	4.5	1.9	1.4	0.79
DJ-180T	Handheld	2 m	13.8 VDC	1.05 A	130 mA	2 - 5 W	10†	50 Ω	2k Ω	<.15 µV at 12 dB	5.2	2.3	1.3	0.77
DJ-180T-TH	Handheld	2 m	13.8 VDC	1.05 A	130 mA	2 - 5 W	10†	50 Ω	2k Ω	<.15 µV at 12 dB	5.2	2.3	1.3	0.77
DJ-F1T-TH	Handheld	2 m	13.8 VDC	1.4 A	130 mA	5 W	40	50 Ω	2k Ω	<.15 µV at 12 dB	4.3	2.1	1.5	0.83
DJ-580T	Handheld	2m / 440 MHz	13.8 VDC	1.2 A	120 mA	5 W / 5 W	40	50 Ω	2k Ω	<.15 µV at 12 dB	6.65	2.24	1.23	0.97

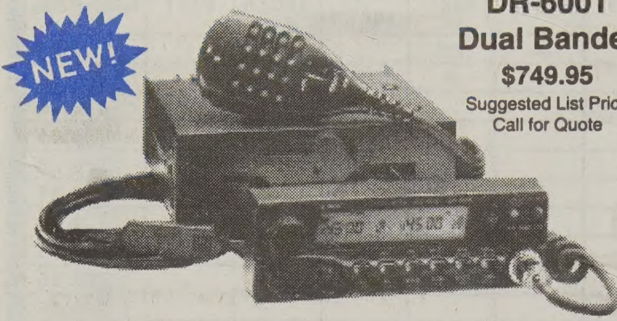
† Optional upgrades to 50 or 100 memories. ** Power output is determined by choice of battery pack.

Alinco Handheld Accessories

	DESCRIPTION	F1T	F1T-HP	G1T	162TD	162T	180T 180TH	560TA	580T	HRO Price
EBP-10NA	Ni-Cd Battery (7.2V 700 mAh)				*	std		std		$45.95
EBP-12NA	Ni-Cd Battery (12V 700 mAh)				*	*		*		$59.95
EBP-16N	Ni-Cd Battery (7.2V 700 mAh)	std	*							$45.95
EBP-18N	Ni-Cd Battery (12V 600 mAh)	*	std							$74.95
EBP-20N	Ni-Cd Battery (7.2V 700 mAh)								std	$43.95
EBP-22N	Ni-Cd Battery (12V 700 mAh)								*	$64.95
EBP-24N	Ni-Cd Battery (7.2V 700 mAh)						*			$71.95
EBP-26N	Ni-Cd Battery (7.2V 700 mAh)						std			$43.95
EBP-28N	Ni-Cd Battery (12V 700 mAh)						*			$65.95
EBP-30N	Ni-Cd Battery (7.2V 700 mAh)			*						$59.95
EBP-31N	Ni-Cd Battery (7.2V 1200 mAh)			*						$76.95
EBP-32N	Ni-Cd Battery (12V 700 mAh)			*						$92.95
EBC-6	Mobile Bracket			*			*			$15.95
EDC-16	Cigarette Lighter Cable/Charger				*	*		*		$15.95
EDC-21	AC Battery Charger ENP-10				*	std		std		$21.95
EDC-22	AC Battery Charger EBP-12N				*	*		*		$21.95
EDC-24	AC Battery Charger EBP-20N	std	std				std		std	$26.95
EDC-26	Cigarette Lighter Cable/Charger							*		$19.95
EDC-34	Quick Charger	*	*		*	*	*	*	*	$99.95
EDC-36	Mobile DC power cable with filter			*					*	$19.95
EDC-37	13.8 volt power cable								*	$7.95
EDC-43	Cigarette Lighter Cable								*	$9.95
EDC-49	Wall Charger						*		*	$21.95
EDC-52	Quick Charger (EBP-30N/31N/32N)			*						$104.95
EDC-55	Wall Charger (EBP-30N/31N/32N)			*						$22.95
EDH-1	Dry Cell Battery Case				std	*		*		$18.95
EDH-5	AA Dry Cell Case	*	*							$19.95
EDH-6	Dry Cell Case								*	$18.95
EDH-11	Dry Cell Case						*			$18.95
EDH-12	DC Jack Adaptor for ext pwr						*			$9.95
EDH-14	Dry Cell Case			*						$20.95
EJ-6U	Tone Squelch Unit				*	*				$44.95
EJ-12U	Tone Squelch Unit	*	*							$52.95
EJ-14U	50 Memory Channel Unit						*			$19.95
EJ-15U	200 Memory Channel Unit						*			$28.95
EJ-16U	Tone Squelch Unit			*						$57.95
EME-4	Ear/microphone w/PTT			*					*	$33.95
EME-6	Earphone			*					*	$13.95
EMS-2Z	Speaker Microphone				*	*		*		$35.95
EMS-8Z	Remote Control Speaker Mic	*	*	*					*	$42.95
EMS-9	Speaker Microphone			*			*			$37.95
EME-10	Headset with VOX	*	*		*	*		*	*	$69.95
EME-11	Earphone Mic with PTT	*	*						*	$49.95
EME-12	Headset w/ear hook VOX & PTT			*			*			$68.95
EME-13	Headset with VOX			*			*			$68.95
EME-15	Tie pin microphone						*			$52.85
ESC-10	Leatherette Case for EBP-10				*	*				$21.95
ESC-11	Leatherette Case for EBP-10							*		$21.95
ESC-17	Leatherette Case								*	$19.95
ESC-18	Leatherette Case EBP-24N						*			$19.95
ESC-19	Leatherette Case EBP-28N						*			$19.95
ESC-23	Soft Case (EBP-30N)			*						$21.95
ESC-24	Soft Case (EBP-31N/32N)			*			*			$19.95
ESC-26	Soft Case w 12V Battery						*		*	$19.95

ALINCO ELECTRONICS INC.

DUAL-BAND MOBILES



DR-600T Dual Bander

$749.95

Suggested List Price
Call for Quote

This high power FM dual-band transceiver combines "Hi-Tech" rugged design with exceptional user-friendliness. Use as a mobile or base station rig. It features three power output settings. Full-duplex cross-band operation and cross-band repeater functions are standard features. The users can exercise full remote control with or without a security code. Both bands can be controlled from a single band HT.

Features include:

- Front panel can be remote mounted if desired with the optional remote kits EDC-19 or EDC-20.
- Remote control via DTMF is possible from any DTMF-equipped radio. The DTMF decode board is built-in as a standard feature
- Dual watch function allows reception of VHF and UHF at the same time.
- High Power: 45 watts on 2 meters and 35 watts on 70 cm.
- Independent VHF and UHF volume and squelch controls.
- Full-duplex, cross-band repeater operation is built-in.
- Extended Receive Range: 118-174 MHz (including AM) and 410-470 MHz.
- Includes 28 memory channels. Program CTCSS tones, shift frequencies and shift directions in each memory.
- Remote Control Microphone allows a number of functions to be controlled directly from the microphone. These include VFO frequency setting, UP/Down control of memory channels, shift to CALL mode, VHF/UHF switching and several more.
- MARS modifiable, with proper license, for extended transmit range.
- CTCSS encode is built-in. Decode with the optional EJ-7U accessory.

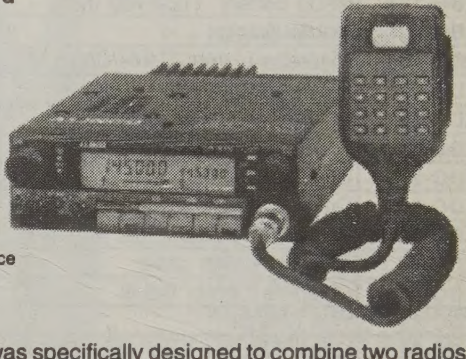
DR-592T

$599.95

Suggested List Price
Call for Quote

The Alinco DR-592T is a full-featured dual-band transceiver that is user friendly. It has 45 watts on 2 m and 35 watts on UHF. It features extended receiver range, simultaneous receiving on both bands, cross-band repeater capability, remote control mic, multiple scanning capabilities and front panel detachable with optional EDC-19

DR-570T Dual Bander



$749.95

Suggested List Price
Call for Quote

The DR-570T was specifically designed to combine two radios in one compact package. It features full-duplex, cross-band capability and is easy to operate.

Major features include:

- 45 watts out on 2m and 35 watts on 70cm.
- Full-duplex, cross-band operation. Duplexer built-in.
- MARS/CAP compatible with the proper license.
- Cross-band repeater factory ready.
- 28 memories.
- One touch band selection / ignore.
- Twin band receiver with easy modification for extended receive.
- Encode / Decode built-in.
- Illuminated front panel controls and large color LCD display with S-meter and power output indication.
- DTMF microphone.
- 4 scanning modes including program scan, memory scan and priority scan.
- Independent call channels, one on each band.
- Automatic band exchange allowing the sub-band to automatically switch to the main.
- Twin priority allows programmable priority on both bands. Independently samples one memory on 2 meters and one on 70 cm.

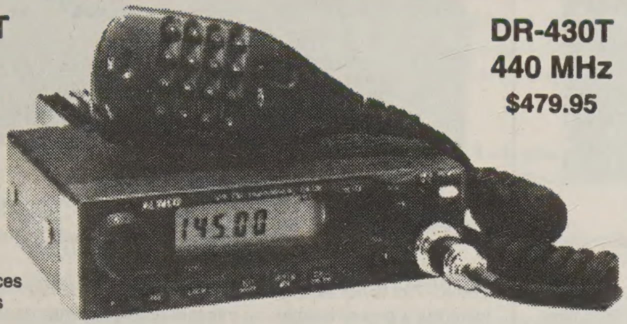
Alinco Mobile Accessories

Model	Description	DR-130T DR-430T	DR-119T	DR-1200T DR-1200TH	DR-570T	DR-590T	DR-599T DR-592T	DR600T	HRO Price
EJ-7U	Tone Squelch Unit					*	*	*	$62.95
EJ-8U	DTMF Unit					*	*	std	$43.95
EJ-19U	Memory Expansion	*							$34.95
EJ-20U	Tone Squelch Unit	*							$44.95
EDC-19	Mounting Kit 9'10" Cable					*	*	*	$36.95
EDC-20	Mounting Kit 16'5" Cable					*	*	*	$39.95
EHM-36A	Microphone	std	std	†	std				$49.95
EMS-3	Remote Control Microphone with DTMF			*		std	std	std	$65.00
PC-15	Power Cord (15 A)	*	*	*	*	*	*	*	$11.95
MB-110	Mounting Bracket with Spring	*	*	*					$19.95
MB-570	Mounting Bracket without Spring				*	*	*	*	$19.95

† Microphone available only for the DR-1200T

Mobiles

DR-130T
2m
$399.95



DR-430T
440 MHz
$479.95

Suggested List Prices
- Call for Quotes

These FM mobile transceivers for 2 meters and 440 MHz condense maximum performance and operating convenience into ultra compact packages. Their impressive features provide maximum flexibility in VHF FM mobile installations.

Features include:

- 50 watts (DR-130T) and 35 watts (DR-430T) RF output with a HI / LO switch.
- Compact size and lightweight.
- 20 multfunction memories are fully programmable. Each channel stores operating frequency and standard offset. Expands to 100 memories with optional EJ-19U.
- Highly visible color LCD display.
- Four scanning modes: VFO, memory, programmed and priority.
- Built-in programmable encode and optional decoder allow restricted access operation.
- The standard microphone includes UP / DOWN buttons and DTMF encoder.

145.00
ALINCO

DR-119T
$399.95
Suggested List Price
Call for Quote

This super-compact mobile for 2 meters is no bigger than an ordinary car stereo. The transceiver gives 50 watts output. It has excellent sensitivity with low intermod. The ergonomic design fits easily into your car. Features include: powerful 50 watts output with a HI/LO power switch; highly visible LCD display; four scanning modes;14 multifunction memory channels; built-in programmable encode / decode functions; microphone offers UP / DOWN buttons and DTMF encoder.

Packet

145.00
ALINCO

NEW!

DR-1200T
$319.95

High Speed Version 9600 Baud
DR-1200TH2
$399.95
Suggested List Prices - Call for Quotes

These 2 meter data radios are engineered to optimize packet radio performance. Both radios are "True FM" and offer a compact package with an economical price. The DR-1200T will work at speeds below 9600 baud and can be used as a voice radio with the optional microphone. The DR-1200TH2 (High Speed) will perform at 9600 baud and lower speeds as well. It is a dedicated data radio and cannot be used for voice.

Features include:

- 25 watts output with a high / low selection.
- 14 multifunction memory channels each storing operating frequency and standard offset.
- Highly visible LCD display.
- 4 scanning modes for band, memory, programmed, and priority scanning.
- Voice operation for the DR-1200T requires the optional EHM-36A microphone. (Voice not available for DR-1200TH2.)

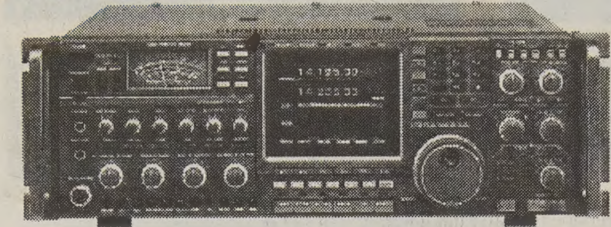
Call for Our Discounts on Alinco Radios

Alinco Mobile Specifications

Model	Primary Use	Frequency Range	Power	Current Drain Xmit	Current Drain Rec	Power Out	Memories	Ant Z	Mike Z	Sensivity	Height in	Width in	Depth in	Weight lbs
DR-130T	Mobile	2 m	13.8 VDC	9.5 A	500 mA	50 W	20*	50 Ω	600 Ω	<.16 µV at 12 dB	1.6	5.5	6.75	2.42
DR-119T	Mobile	2 m	13.8 VDC	11 A	500 mA	50 W	14	50 Ω	600 Ω	<.16 µV at 12 dB	2.0	5.5	6.75	2.42
DR-1200T/TH2	Packet	2 m	13.8 VDC	5.5 A	500 mA	25 W	14	50 Ω	600 Ω	<.16 µV at 12 dB	2.0	5.5	6.75	2.25
DR-130T	Mobile	440 MHz	13.8 VDC	9.5 A	500 mA	35 W	20*	50 Ω	600 Ω	<.16 µV at 12 dB	1.6	5.5	6.75	2.42
DR-570T	Mobile	2m/440 MHz	13.8 VDC	11 A	600 mA	45 W/35 W	28	50 Ω	600 Ω	<.16 µV at 12 dB	2.0	5.9	6.9	3.74
DR-592T	Mobile	2m/440 MHz	13.8 VDC	11 A	600 mA	45 W/35 W	28	50 Ω	600 Ω	<.16 µV at 12 dB	2.0	5.9	7	3.3
DR-600T	Mobile	2m/440 MHz	13.8 VDC	10 A	800 mA	45 W/35 W	28	50 Ω	600 Ω	<.16 µV at 12 dB	2.0	5.9	7	3.3

* Expand to 100 with optional EJ-19U

ICOM



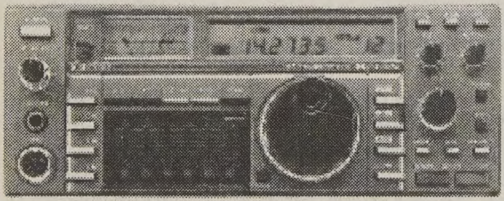
IC-781

$7208.95
Suggested List Price—Call for Quote

Here is the ultimate amateur HF transceiver. The radio is delivered complete. The only internal option available is the FL-103 wide SSB filter. It is the optimum radio for contesting, DX chasing or just rag chewing.

Major features include:

- A 5-inch CRT provides an advanced spectrum scope analyzer. Shows status of the radio on two menu screens and 17 operational screens including displays of memory channels, sleep and daily times, built-in clocks and packet terminal monitor.
- Built-in automatic antenna tuner permits fast tuning for each band by remembering band settings. Tunes SWR up to 3:1.
- Full break-in keying.
- Dual Watch (dual receive).
- Direct Digital Synthesizer (DDS) System provides low phase noise and rapid PLL lock up time. Fast T/R switching makes this perfect for packet and AMTOR.
- Multiple scanning modes.
- 150 watt output transmitter.
- All modes of operation: SSB, CW, RTTY, FM and AM.
- Twin bandpass tuning. Noise blanker, APF and notch filter.
- Multifunction keyboard to control the radio operation.
- Band stacking registers.



IC-735

$1292.95
Suggested
List Price
Call for Quote

The IC-735 HF transceiver has 12 memories with memory battery backup, program and memory scan, scanning mike, AGC, speech processor, and notch filter. Use with the optional AT-150 Automatic Antenna Tuner and the PS-55 External Power Supply.

Major features include:

- General coverage receiver, 0.1 to 30 MHz.
- 100W output with 12VDC. 100% duty cycle finals.
- Adjustable noise blanker. Receiver incremental tuning (RIT). Passband tuning.
- HM-12 hand microphone included.
- 105dB dynamic range receiver.
- Built-in attenuator and preamp.
- 12 memory channels with programmed and memory scanning.
- CW semi / full break-in keying.
- Extra large LCD readout.
- Optional CW narrow filter and optional internal electronic keyer are available.

IC-736

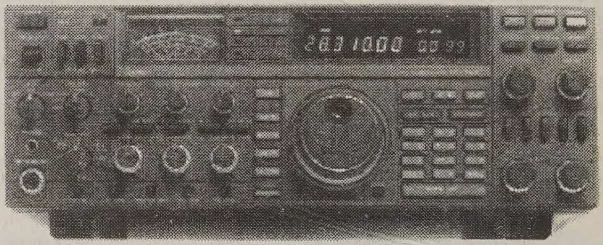
NEW!

$2250.00
Suggested List Price—Call for Quote

The IC-736 is not simply an IC-737A with 50 MHz band capability but also includes a power supply, an internal antenna tuner usaeable for both HF and 50 MHz bands, 1 Hz indication and quick split with pre-programmable ofset function.

Other features include:

- 500 kHz - 29.995 Mhz and 50 Mhz-54MHz receive.
- Automatic antenna tuner with present memories for each 100 kHz step.
- Double band stacking register for all bands..
- Pass band tuning and AF notch.
- 101 memory channels including 10 split memories and 2 scan edges.
- Programmed, memory and selectmemory scan.
- Full and semi break-in CW operation.



IC-765

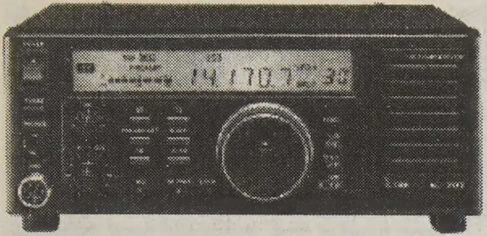
$3209.95
Suggested List Price—Call for Quote

This HF all-band transceiver has a heavy-duty design for the serious HF enthusiast. It is an ideal mid-priced, high-performance home transceiver.

Major features include:

- Fully automatic high-speed antenna tuner. The built-in CPU memorizes previously matched conditions on each band and begins tuning from that point.
- Complete system for CW operators. High speed CW full break-in capability. Includes an electronic keyer, iambic key jack, keying speed control, CW pitch control and 500 Hz CW filter.
- Multiple scan functions.
- The DDS system provides low phase noise and high speed PLL lock up times.
- Large fluorescent 10 Hz digital display.
- Band stacking register. Each band memorizes the last used frequency, mode and IF filter.
- Features a 10 dB preamp and selectable attenuator.
- 99 channel memory.
- IF shift, selectable AGC, and notch filter.
- Options: CR-282 high stability crystal unit, UT-30 programable tone encoder, UT-36 voice synthesizer, FL53A 250 Hz CW filter.

HF TRANSCEIVERS



IC-707

$1032.95

Suggested List Price—Call for Quote

Icom designed the IC-707 after listening to thousands of new operators around the world. They wanted Icom quality, but in an easy-to-use radio with just the basic features.

The IC-707 is built to Icom's relentless high standards, without expensive "extras." It still provides a general coverage receiver, all mode operation (optional FM unit required) and provides up to 100 watts output.

This rig is perfect as a backup or as the first HF transceiver for the new ham!

Major features include:

- Easy to use push button functions.
- Easy to see large LCD display that will not wash out.
- General coverage receiver covers 500 kHz to 30 MHz.
- All mode operation, USB, LSB, CW, AM and FM (with optional UI-9).
- 32 memory channels with multiple scanning features.
- 100 watts output on SSB, CW and FM. 25 watts AM. Output is continuously adjustable from 5 watts to the maximum power.
- Covers all HF amateur bands.
- Requires 12 VDC at 20 A for transmit.
- Optional UT-30 programmable tone encode unit, CR-338 high stability crystal unit and CW filters available.

Call Toll Free for Our Low Discount Prices on Icom Radios

IC-737A

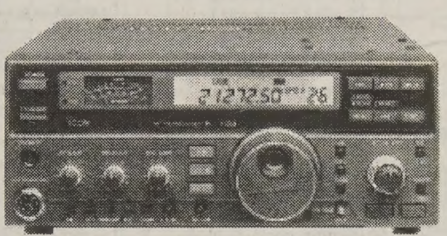
$1801.00

Suggested List Price
Call for Quote

The IC-737A will give you the most desired features in an HF radio at a most desirable price. It comes with built-in antenna tuner, attenuator, and preamp.

Major features include:

- Vox built-in.
- General coverage receiver 0.1 to 30 MHz with Direct Digital Synthesis (DDS).
- 100W output, 100% duty cycle transmit.
- All modes including SSB, CW, AM, FM.
- Memory and band scanning. 101 memories storing frequency, mode, antenna selection and tuner on/off condition.
- Adjustable bandpass tuning.
- Adjustable notch, RIT and noise blanker.
- Built-in CW keyer with semi & full break-in.



IC-728

$1160.00

Suggested List Price—Call for Quote

This HF all-band transceiver is designed for beginners and for mobile operation. Functions such as passband tuning and speech processing supplement all the basic features.

Major features include:

- General coverage, triple conversion receiver 500 kHz - 30 MHz.
- SSB, CW and AM receive are standard. AM transmit and FM operation are available with the optional UI-7.
- Utilizes Icom's Direct Digital Synthesizer.
- Passband tuning and speech compressor.
- 26 memory channels with dual VFO.
- Multiple scanning capabilities.
- 10 Hz minimum step tuning plus RIT.
- CW break-in with adjustable delay.

Special Closeout Pricing

IC-725

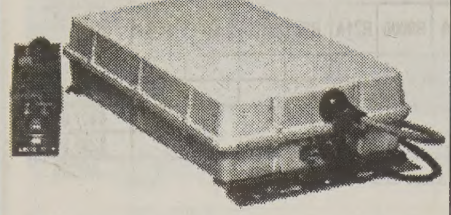
$972.00

Suggested List Price—Call for Quote

This compact, light weight, easy-to-operate HF radio is for base-station, portable, or mobile operation. It uses a Direct Digital Synthesizer to provide minimum phase noise and faster PLL lock up time. It covers amateur bands 160-10 meters and has a general coverage receiver.

Major features include:

- Receives approximately 30 kHz - 33 MHz.
- 10 Hz step tuning or instantly select 20 Hz, 50 Hz, 1 kHz or 1 MHz.
- 26 memories store frequency and mode.
- Multiple scan modes.
- Band stacking registers store last used frequency for each band.
- Built-in RF preamp / attenuator.
- CW filter options: FL-100 and FL-101.



AH-2

This automatic HF antenna tuner for the IC-735 is ideal for mobile use since no manual tuning is needed. For indoor or outdoor use. 3.5 MHz to 30 MHz. System includes an antenna (AH-2b), the AH-2a tuner and controller units. The AH-2a (tuner and controller) and the AH-2b (mount and whip) may be purchased separately.

Suggested ListPrices: AH-2 $941.00
AH-2a $691.00
AH-2b $248.00

AH-3

The AH-3 automatic antenna tuner operates with the IC-725, IC-728, and IC-729 HF transceivers. Use it with the AH-2b antenna element for mobile operation. The weatherproof design has automatic digital control tuning and eight frequency memories. **Suggested List $594.95**

AT-150

This matching tuner for the **IC-735** is fully automatic and interfaces directly with the radio. With the appropriate cables, the AT-150 can also be used with the other Icom HF radios. **Suggested List $539.95**

AT-160

This automatic antenna tuner is designed for the **IC-728/729.** It has a CPU with 9 memories for quick tuning. Attach it easily to the IC-728 / 729 side panel and control it from the transceiver. **Suggested List $442.95**

AT-500

Fully automatic HF antenna tuner designed for short tune-up time. Automatic band switching (compatible with the IC-2KL linear amplifier). Matching circuit can be preset for each band. Four antenna connections. Maximum input power 500W. AC or DC. **Suggested List $705.95**

Icom HF Tuners

Features	AT-160	AT-150	AH-3	AH-2a	AT-500
Input Power (Watts)					
Max	100	100	120	120	500
Min	8	8	10	10	50
Auto Tune Time (seconds)					
New Band	≤3	≤3	2 - 4	2 - 4	4 - 7
Same Band	≤3	≤3	<1	<1	≤3
Tuning Accuracy	VSWR<1.2:1	VSWR<1.2:1	VSWR<1.5:1 with AH2b	VSWR<1.5:1 with AH2b	VSWR<1.2:1
Auto Antenna Selection		4 antennas			
Auto Band Switching	yes	yes	yes	yes	yes
Preset Matching	CPU Controlled	Auto Preset	CPU Controlled	CPU Controlled	yes
Power Supply	13.8 VDC	13.8 VDC	13.8 VDC	13.8 VDC	13.8 VDC 117 AC
Frequency Coverage	160, 80, 40, 30, 20, 17, 15, 12, 10 Meters	160, 80, 40, 30, 20, 17, 15, 12, 10 Meters	1.8-28 MHz	1.8-28 MHz	160, 80, 40, 30, 20, 17, 15, 12, 10 Meters
Radios	Attaches Solidly to IC-728 & 729	All Icom HF Rigs	Weather resistant 725, 726, 728, 729	Weather resistant 735, 751A	All Icom HF Rigs
Suggested Retail	$442.95	$539.95	$594.95	$691.00	$705.95

Icom HF Specifications

				Power Output										
Model	Receive Freq Range	Power Supply	Current Drain Xmit	A M	F M	SSB	C W	FSK	Mike Z	Receive Circuitry	Sensitivity 1.8-30 MHz	RIT / XIT Range	Notch Atten	Audio
IC-707	500 kHz - 30 MHz	13.8 VDC	20A	25	100	100	100		600 Ω	Double Conversion	<.16µv at 10 dB	±1.2 kHz		>2.6 W
IC-725	500 kHz - 30 MHz	13.8 VDC	20A	40	100	100	100		600 Ω	Double Conversion	<.16µv at 10 dB	±1.2 kHz		
IC-728	500 kHz - 30 MHz	13.8 VDC	20A	40	100	100	100		600 Ω	Triple Conversion	<.16µv at 10 dB	±1.2 kHz		>2.6 W
IC-735	100 kHz - 30 MHz	13.8 VDC	20 A	40	100	100	100		600 Ω	Triple Conversion	<.15µV at 10 dB	±800 Hz		>3 W
IC-736	#	120 VAC	500 VA	40	100†	100†	100†		600 Ω	Triple Conversion	<.15µv at 10 dB	±1 kHz		>2.6 W
IC-737A	100 kHz - 30 MHz	13.8 VDC	20 A	50	100	100	100	100	600 Ω	Triple Conversion	<.15µV at 10 dB	±9.9 kHz		>2.6 W
IC-765	100 kHz - 30 MHz	120VAC	650 VA	40	100	100	100	100	600 Ω	Quadruple Conversion	<.15µV at 10 dB	±9.9 kHz	45 dB	>2.6 W
IC-781	100kHz - 30MHz	120VAC	760 VA	75	150	150	150	150	600 Ω	Quadruple Conversion	<.16µv at 10 dB	±9.9 kHz	45 dB	>2.6 W

† Output is continuously adjustable from 5 to 100 W # 500 kHz - 29.995 MHz and 50 -

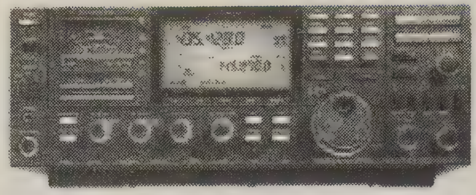
Icom HF Filters

Filter	Center Frequency	Bandwidth	Mode	781	765	737A	736	735	729	728	725	726	707	R71A	R72	R9000	List Price
FL44A	455 kHz	2.4 kHz	SSB		std									*			$206.95
FL52A	455 kHz	500 Hz	CW	std	std	*	*						*			*	$137.95
FL53A	455 kHz	250 Hz	CW	std	*	*	*						*				$137.95
FL102	9.0100 MHz	6.0 kHz	AM	std	*												$68.95
FL33	9.0100 MHz	6.0 kHz	AM														$68.95
FL100	9.0106 MHz	500 Hz	CW			*	*		*	*	*	*		*	*		$96.95
FL32A	9.0106 MHz	500 Hz	CW	std	std			*						*			$82.95
FL63A	9.0106 MHz	250 Hz	CW					*									$68.95
FL101	9.0106 MHz	250 Hz	CW	std	*	*	*		*	*	*	*			*		$96.95
FL70	9.0115 MHz	2.8 kHz	SSB														$82.95
FL103	9.0115 MHz	2.8 kHz	SSB	*										std			$89.95

Icom Base Station Accessories

OPTIONS		HF RADIOS										VHF / UHF RADIOS					RECEIVERS						
		781	765	751A	737A	735	729	728	726	725	707	575H	275H	475H	820H	970	R9000	R71A	R72	R100	R7000	R7100	Suggested List
External AC Power Supply	PS-15				*						*				*								$244.95
	PS-55			*	*	*	*	*	1	1	*	*	*	*	*								$265.95
	PS-30			*	*	*	*	*	*	*	*				*								$407.95
Internal AC	PS-35			*																			$239.95
External Speakers	SP-3	*	*	1	*	*	*	*	*	*	*	*	*	*	*	*	*	1	*	*	1	*	$82.95
	SP-7			*	*	1	*	*	1	1	*	1	1	1	*			*	*	*	*	*	$68.95
	SP-20	1	1	*	*	*	*	*	*	*	*	*	*	*	*	*	1	*	*	*	*	*	$179.95
	SP-21				*						*				*								$83.95
HF Linear Amplifiers	2KL	2	2	*	*	2	*	*	2	2	*												$2,349.95
	4KL	*	*	6	*	*	*	*	*	*	*												$8,021.95
Automatic Antenna Tuners	AH-2a		*	6			*	*															$691.95
	AH-3				*		7	*	*	*	*												$594.95
	AT-100			*		2			2	2	*												CALL
	AT-150			6	*	*	*	*	*	*	*												$539.95
	AT-160						*	*			*												$539.95
	AT-500	*	*	*		2	*	*	2	2	*												$705.95
Antenna Selectors	EX-20											*											CALL
	EX-627	*	*	6	*	*	*	*	*	*	*												CALL
Antennas	AH-2B		*	*	*	*	*	*	*	*													$248.95
	AH-610											*											$137.95
Weather Proof Preamps	AG-25												*		*	*							$154.95
	AG-35													*	*	*							$159.95
	AG-1200															*							$137.95
Microphones	HM-36	*	*	*	std	*	*	*	*	*		*	*	*		*							$54.95
	SM-6	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*							$82.95
	SM-8	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*							$123.95
	SM-20	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*							$165.95
Mounting Brackets	MB-5					*	*	*	*	*	*	*	*	*	*				*			*	$43.95
	MB-12																	*			*		$43.95
	MB-18			*																			$43.95
	MB-49				*																		$43.95
Handles	MB-19	3	*														3						$54.95
	MB-23						*	*	*	*	*	*	*	*	*				*			*	$11.95
Remote Controllers	RC-11																	*					$85.95
	RC-12																				*		$85.95
TV Adapters	TV-R7000																				*		$207.95
	TV-R7100																					*	$248.95
	TV-970															*							$367.95
	TV-1275																						CALL
CI-V System	CT-16	*	*	4	*		*	*	*	*	*		*	*			*	4					$115.95
	CT-17	*	*	4		*	*	*	*	*	*		*	*	*		*	4	*		*	*	$115.95
	UX-14			*																			$86.95
High Stability Crystal Units	CR-64			*			*	*	*	*		*	*	*				*	*				$96.95
	CR-263																						$123.95
	CR-282		*		*																		$122.95
	CR-293														*								$276.95
	CR-338										*												CALL
Keyer Unit	EX-243			3		*										*							$82.95
FM Unit	EX-257																	*					CALL
	UI-8																		*				$73.95
	UI-9										*												$86.95
AM-FM Unit	UI-7							*		*													$82.95
Tone Encode	UT-30		*	*		*	*	*	*	*	*		*	*									$40.95
Tone Squelch	UT-34											*	*	*		*							$68.95
	UT-50														*								$54.95
Voice Synthesizer	EX-310			*														*			*		$69.95
	UT-36	*	*										*	*	*	*	*		*			*	$54.95

1: Style and size are matched with the equipment. 2: An optional OPC-118 CABLE is required. 3: Included. 4: An optional UX-14 is required.
5: Option unnecessary. 6: An optional OPC-137 CABLE is required. 7: for HF band only.



IC-970A **$3665.00**

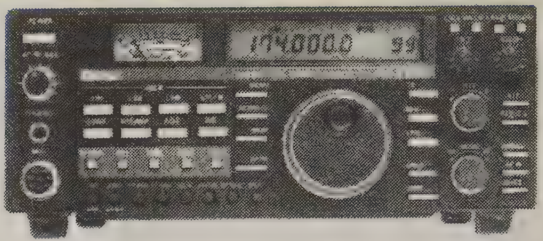
IC-970H **$3964.00**

Suggested List Prices—Call for Quotes

Here is a world class multi-band radio for serious operators on the 144, 430 and 1200 MHz bands. This unit is suitable for satellite communications, EME operations and propagation tests as well as every day operation. For satellite operations it automatically tracks uplink and downlink frequencies.

Major features include:

- Dual-band transceiver standard for 2 meters and 440 MHz.
- Two models. "A" model has 25 watts output on 2m and 440 MHz. "H" model has 45 watts on 2m and up to 40 watts on 440 MHz.
- All mode operation (FM, SSB and CW).
- Multiple action scan functions. Dual watch capability.
- Built-in pager and code squelch functions compatible with the IC-2SAT. No options necessary. Optional UT-34 provides decode function with a beep.
- Expand the receiver capability to cover 50-905 MHz with the optional UX-96 receiver unit.
- Up to 396 memory channels and 5 call channels..
- Covers 1.2 GHz with optional UX-97.
- Simultaneous dual-band receive capability.
- Completely independent MAIN and SUB dials, volume and squelch controls.
- Advanced Icom DDS System installed for fast PLL lockup times.
- Built-in AC supply.



IC-275H **$1712.00**

IC-475H **$1957.00**

Suggested List Prices—Call for Quotes

With their superior performance and features, the famed IC-275H and IC-475H lead the way on the 2 meter and 430 MHz bands. The state-of-the-art DDS (Direct Digital Synthesizer) system enables high speed lockup times and higher carrier-to-noise characteristics and at the same time allows 10 Hz tuning steps. High-speed transmit / receive switching at approximately 5 msec is a packet operators's delight.

Its compact size allows for all-mode operation almost anywhere, even in your vehicle. For satellite communications, connect an optional CT-16 Satellite Interface Unit between these transceivers for automatic tracking of uplink and downlink frequencies.

Major features include:

- 100 watts for IC-275H and 75 watts for IC-475H.
- USB, LSB, CW and FM modes.
- DDS system.
- 99 memory channels.
- Programmable call channel.
- Noise blanker and adjustable IF notch filter.
- CW full/semi break-in capability.
- Programmable offset capability.
- Multiple scan functions.
- AF speech processor.
- Data switch for data communi-cations.
- Optional voice synthesizer and tone squelch units.
- CI-V computer control system.

IC-575H **$2021.95**

Suggested List—Call for Quote

A beautifully sophisticated 28 / 50 MHz transceiver designed for those who are serious about DX'ing. All the latest in Icom's innovative technology including 100 watt output power, DDS System, CW full / semi break-in capability has gone into a compact body. To get propagation information, receive overseas TV stations with in the 26-56 MHz range and then store them into one of the memory channels.

Major features include:

- USB, LSB, FM, AM, and CW modes.
- Full 100 watt output power.
- DDS System.
- CW full/semi break-in capability.
- 26-56 MHz continuous receive.
- Noise blanker and adjustable IF notch filter.
- Built-in speech compressor.

Icom VHF Specifications

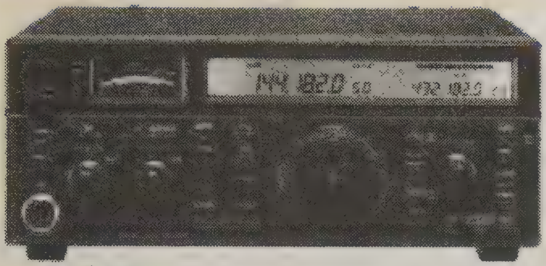
	Freq Range	Mode	Power Supply	Current Drain Xmit	Curernt Drain Rec	Power Out	Ant Z	Mike Z	Sens	RIT/XIT	Audio Pwr	Built-in AC Supply
IC-28H	2 m	FM	13.8 VDC	10.5 A	800 mA	45 W	50 Ω	600 Ω	<.18 µV		2.4 W	no
IC-275H	2 m	All	13.8 VDC	20 A	1 A	100 W	50 Ω	600 Ω	< .1 µV	±9.9 kHz	2 W	no
IC-281H	2 m/440 rec	FM	13.8 VDC	10.5 A	800 mA	50 W	50 Ω	600 Ω	<.16 µV		2.4 W	no
IC-449A	440 MHz	FM	13.8 VDC	9.5 A	800 mA	35 W	50 Ω	600 Ω	<.16 µV		2.4 W	no
IC-475H	440 MHz	All	13.8 VDC	20 A	1 A	80 W	50 Ω	600 Ω	< .18 µV	±9.9 kHz	2 W	no
IC-575H	6 m/10 m	All	13.8 VDC	20 A	1 A	100 W	50 Ω	600 Ω	<.25µV	±9.9 kHz	2 W	no
IC-820H	2m/440 MHz	All	13.8 VDC	16 A	2.0 A	45/35 W	50 Ω	600 Ω	<.11µV		2 W	no
IC-970A	2 m/440 MHz/1.2 GHz	All†	110 VAC	400 VA	60 VA	25 W	50 Ω	600 Ω	<.18 µV	±9.9 kHz	1.5 W	YES
IC-970H	2 m/440 MHz/1.2 GHz	All†	13.8 VDC	16 A	2.5 A	45/35 W	50 Ω	600 Ω	<.18 µV	±9.9 kHz	1.5 W	YES
IC-2330	2 m/ 220 MHz	FM	13.8 VDC	10.5 A	1.8 A	25 W	50 Ω	600 Ω	<.16 µV		2.4 W	no
IC-2340H	2m/440 MHz	FM	13.8 VDC	10.5 A	1.8 A	45/35 W	50 Ω	600 Ω	<.18 µV		2.4 W	no
IC-2700	2m/440 MHz	FM	13.8 VDC	12A	1.8 A	50/35 W	50 Ω	600 Ω	<.16 µV		2.0 W	no
IC-901	2 /6 /10 m/440/1.2 **	All†	13.8 VDC	*	600 mA	10/45W*	50 Ω	600 Ω	< .25 µV		2.4 W	no
IC-D100	2 m/440 MHz/1.2 GHz	FM	13.8 VDC	3.8-12A	1.8 A	50/35/10 W	50 Ω	600 Ω	< .16 µV		> 2.4 W	no

† All mode on 2m portion only. SSB/CW operation requires optional IC-UXS92

* Depends on module selected ** 2m/440 modules are built-in; others optional

VHF / UHF Base Stations & GPS

VHF / UHF Base



NEW!

IC-820H

$TBA

Icom has announced the IC-820H base station dual-band transceiver with 45 watts on VHF and 40 watts on UHF.

This is the perfect rig for satellite work. It is compact and competitively priced without sacrificing features.

Its newly designed DDS features 1 Hz resolution. The IF shift provides for good interference reductions. Satellite communications are enhanced with satellite memory and tracking functions.

Major features include:

- Dual-band transceiver for 2 meters and 440 MHz.
- 45 watts output on 2m and up to 40 watts on 440 MHz.
- All mode operation (FM, SSB and CW).
- Newly designed DDS for 1 Hz resolution. The IC-820 has a normal PLL as the main loop and a DDS as the sub-loop. The new I-loop has a single loop and generates a signal with 1 Hz resolution.
- The compact size enables easy installation in a shack as well as a vehicle. Overall dimensions may be small, but important points such as LCD size and space between switches are more than adequate.
- High-stability crystal.
- Optional tone scan.
- 2 VFO's for both VHF and UHF bands.
- IF-shift has been provided for interference reduction. The IF shift circuit shifts the center frequency of the receiver passband electronically to evade interfering signals.
- Satellite communication functions include reverse and normal tracking on the main and sub-band VFOs and includes a Doppler compensation function. There are 10 satellite memories for easy selection of desired satellite frequencies.
- Packet operation is supported up to 9600 bps. The DATA terminal is connected to its modulator circuit directly so no modification is necessary even at 9600 bps. The modulator circuit is designed to prevent exceeding the maximum deviation even with large amounts of data.
- 50 memory channels which can be user allocated to main and sub-bands.
- 2 antenna connectors for VHF and UHF operation.
- RIT function.
- Noise blanker to eliminate pulse-type noise.
- Attenuator to prevent signal distortion.
- Separate main and sub S-meters.

For Speedy Delivery, HRO Ships from the Store Nearest You

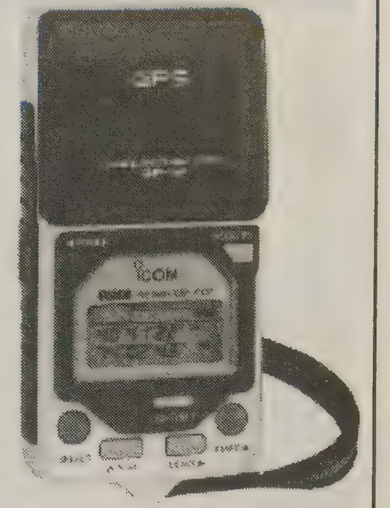
Pocket-Sized GPS

NEW!

GP-22

$999.95

Suggested List Price
Call for Quote



Whether you are sailing the open seas or hiking in the back country, Icom's CP 22 GPS (Global Positioning System) Receiver gives fast and accurate positioning worldwide in palm-sized dimensions.

The GPS-22 combines powerful navigation features and user-friendly operation in a rugged, water resistant body. It features a 5 channel receive system for outstanding reception and precision measurements. The design makes operation a simple pleasure.

5-channel Parallel Receiving
Superior to sequencing receivers, the GP-22 employes a 5-channel, parallel receive system for faster and more precise positioning fixes. Up to 5 satellites can be tracked continuously, providing 2- or 3-dimensional fixes.

Simple Operation
Designed for ease of use, the GPS-22 has a minimum of controls and a large LCD display that is backlit for night viewing. A simple push of one or two switches gets you needed information so you can concentrate on the activity at hand.

Versatile Navigation Functions
In addition to positioning fixes, instant destination navigation, route navigation, and other powerful functions such as course and speed over ground (COG/SOG), cross track error, estimated time of arrival (ETA), bearing and range to a waypoint, and much more are available.

Other features include single calculation for power saving; low battery warning; selectable measurement units; time and date indication (local or UTC); integral antenna; 93 datum for worldwide coverage.

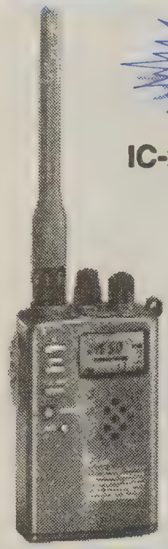
Icom Handheld Batteries / Chargers

Model	Volts	Rating mAh	Wall Charger	Desk Charger	HRO Battery Prices
BP3	8.4	270	BC-25u	BC-35	$47.95
BP-7	13.2	450	BC-16u	BC-35	$87.95
BP-8	8.4	800	BC-16u	BC-35	$87.95
BP-70	13.2	270	BC-16u	BC-35	$82.95
BP-81	7.2	110	BC-74A	BC-72	$47.95
BP-82	7.2	300	BC-74A	BC-72	$60.95
BP-83	7.2	600	BC-74A	BC-72	$65.95
BP-84	7.2	1000	BC-74A	BC-72	$87.95
BP-85	12	340	BC-74A	BC-72	$113.95
BP-101	7.2	700		BC-79*	$68.95
BP-102	7.2	1200		BC-79*	$90.95
BP-103	12	600		BC-79*	$104.95
BP-111	7.2	400	BC-74A	BC-80	$62.95
BP-112	7.2	700	BC-74A	BC-80	$68.95
BP-113	7.2	1200	BC-74A	BC-80	$90.95
BP-114	12	400	BC-74A	BC-80	$104.95
BP-121	7.2	400	BC-77A	BC-79*	$62.95
BP-122	7.2	700	BC-77A	BC-79*	$64.95
BP-123	7.2	1200	BC-77A	BC-79*	$90.95
BP-124	12	400	BC-77A	BC-79*	$104.95
BP-131	7.2	900		BC-79*	$96.95
BP-132	12	600		BC-79*	$109.95
BP-132A	12	600	BC-77A	BC-79*	CALL
BP-157	7.2	900	BC-77A	BC-79*	CALL
BP-160	7.2	700	BC-77A	BC-79*	CALL

*Adapters are required. See Adapter Table.

ICOM

Single Band



Special Low Price

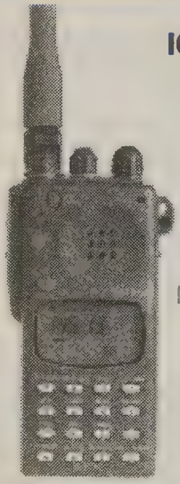
IC-2iA / IC-4iA

The IC-2iA (2m) and IC-4iA (440 MHz) are ultra-slim transceivers designed for maximum portability and convenience.

Including a NiCd battery pack, the radios fit in a shirt pocket.

With external 13.8 VDC, output is 5 watts. Each has 10 memories, multiple scan functions, 24 hour clock, built-in UT-72 tone squelch standard and LCD display.

220 MHz



IC-P3AT

Here is a compact, easy to use handheld model for 220 MHz. It is a perfect companions for outdoor activities.

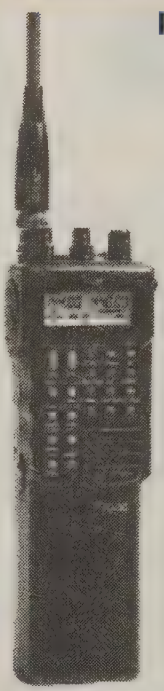
Major features include:

- 100 memory channels. 10 retain offsets and tone information.
- Multiple scanning features.
- Artificial Intelligence function to assist operation.
- 4 selectable power out levels.
- Dual function display with 24- hour clock.
- 5W out with external 13.8 VDC.

BC-79 Adapters

Adapter	For Batteries	HRO Price
AD-22	BP-101, BP-102, BP-103	$32.95
AD-25	BP-131A, BP-132A, BP-157A	$32.95
AD-26	BP-121, BP-122, BP-123, BP-124	$12.95
AD-26	BP-100, BP-130	$12.95
AD-28	BP-131, BP-132	$12.95

Dual -Band Handhelds



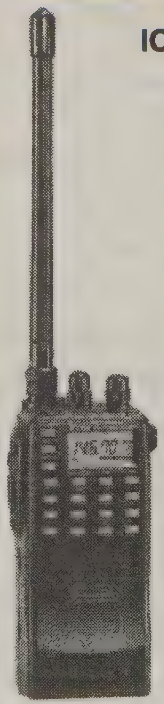
IC-W2A

Featuring perfect simultaneous two-band signal receiving capability, this 2m / 440 MHz dual-band offers just the right combination of size and features. Receive two band signals at once or receive on one band while transmitting on another. By using the built-in pager and code squelch, you need not receive undesired communications.

Features include:

- Full-duplex cross-band.
- Built-in pager and code squelch.
- 60 memory channels—30 on each band with a call channel on each.
- 4 DTMF code memories for autodial each coding up to 15 digits.
- 5W output if connected to 13.5-16VDC power supply.

2 Meters



IC-2GXAT

Whether you are a beginner or seasoned veteran, you will like the surprisingly simple operation of this high power 2-meter handheld.

Features include:

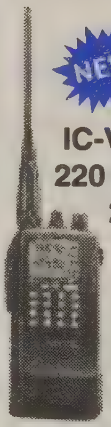
- Full 7 W of output with the BP-132A battery or 13.5 VDC.
- 40 repeater oriented memory channels and 1 call channel.
- Automatic repeater function.
- Channel number indication.
- Tone scan function.
- DTMF redial and 5 DTMF auto dial memories.
- Automatic power saver.
- Programmed or memory scan with skip function.
- Squelch monitor function.
- Subaudible tone encoder, tone squelch and pocket beep. Optional pager and code squelch (UT-49 required)
- Lighted display with 5 sec. timer.

IC-W21AT
2m & 440 MHz

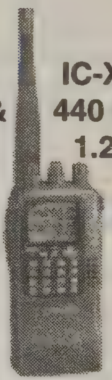
Icom offers a radically new operating style to make handheld communications even more convenient. With just a few switches and an independent volume and squelch for each band, the 21AT series is extremely simple to operate. Icom calls this new operation style the "whisper function." Enjoy telephone-style communication through a microphone equipped battery pack that enables full-duplex cross-band operation.

When you access a repeater, all settings are automatically memorized into a special independent repeater channel. Recalling the last-used repeater information is quick and simple.

NEW!



IC-V21AT
220 MHz & 2m



IC-X21AT
440 MHz & 1.2 GHz

NEW!

Features for the IC-W21AT, IC-V21AT, and IC-X21AT include:

- Receive 2 signals on the same band plus full crossband operation.
- IC-W21AT only has expanded receive 138 -174 MHz.
- Battery capacity indicator.
- Remote control from an optional HM-75 speaker-microphone.
- 70 channels. 32 memories and 1 call channel that store repeater information plus 2 scan edge channels for each band.
- Built-in pocket beep, pager code squelch and tone squelch.
- 4 DTMF memory channels.
- 5 output power levels.
- Separate speaker control for directing one or both bands to an external speaker.
- Key for quick access to often-used functions.

HANDHELDS

Dual-band Receivers

NEW!

IC-T21A
2m / 70 cm

IC-T41A
70 cm / 2m

The IC-T21A is a transceiver on 2 meters and a receiver on 440 MHz. The IC-T41A is a transceiver on 440 MHz and a 2 meter receiver. This allows you to have full cross band operation between 2 m and 70 cm.

Features include:

- 2 band receiving capability plus full duplex cross-band operation.
- High speed scan functions (33 channels per second).
- 100 memory channels with repeater memory.
- 5 DTMF memory channels.
- 5 output power levels and 8 tuning steps. 6 Watts with 13.5 VDC.
- 24 hour system clock.
- Dial select for quick frequency change.
- Tone scan capability to access repeaters with an unknown tone frequency.
- Built-in pager, code squelch, pocket beep and tone squelch.
- Power on/off timers and auto power off function.
- Optional speaker microphone with remote control capability.

IC-2SRA
2m

IC-4SRA
70 cm

Limited Supply with 50-905 MHz Receive

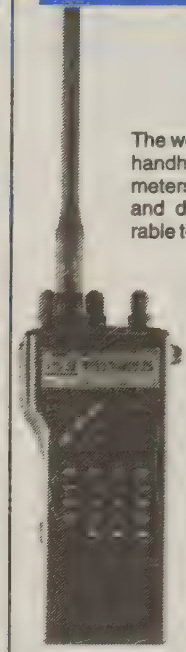
Previously, a transceiver and wideband receiver were necessary to enjoy both QSO and wideband receiving. Icom now offers handhelds with wideband receive capability from 50 to 905 MHz. Listen to a ham band signal and another from FM broadcasting, TV audio, VHF air, marine bands in AM, FM and wide-FM modes.

The IC-2SRA is a transceiver for 2 meters, the IC-4SRA, for 440 MHz and both are wideband receivers.

Specific features include:

- Receive frequency coverage from 50 to 905 MHz.
- 5 watt output with external 13.8 VDC
- Advanced frequency monitoring system.
- 96 memory channels. 33 channels for amateur bands and 63 for the wideband receiver.
- Includes a 24 hour clock; 4 DTMF memory channels.
- Built-in pager and code squelch.

Triband



IC-D1A

The world's first and only triband FM handheld transceiver operates on 2 meters, 70 cm and 1.2 GHz bands, and delivers performance comparable to three base units in one case.

All three bands are factory included, not optional. All three receive simultaneously. Transmit on one while receiving on either or both of the others.

Special features include separate controls and functions for each band, 78 memories (26 per band), 4 DTMF autodial-ing memories, all PL tones and a 24 hour clock with on/off timers. This moves amateur radio's FM handhelds into the 21st century!

Features include:

- Three handhelds in one. Covers 144-148 MHz, 440-450 MHz and 1240-1300 MHz.
- Receives 138-174 MHz covering the NOAA weather and public service frequencies.
- Simultaneous three band reception monitors all VHF and UHF channels and repeaters at once. Switch to a dual or single band as desired.
- 2 watts output on 2m and 70cm; 5 watts with the optional BP-103. Output on 1.2 GHz is 1 watt.
- 78 memories: 26 per band. All memories store any related band frequency, TX offset, PL tone and digital squelch settings.

Icom Handhelds

Model	Frequency	Power Supply	Power Out Transmit*	Current Transmit	Drain Receive	Sensitivity	Height in(cm)	Width in(cm)	Depth in(cm)	Weight oz(g)	Sugg. List
IC-2AT	144-147.995 MHz	8.4 VDC	2.0/.5 W	.55 A	200 mA	<.5µV/20 dB	6.6(16.7)	2.6(6.5)	1.4(3.5)	19(535)	$359.95
IC-2IA	144-148 MHz†	13.8 VDC	2.5/.02 W	1.2 A	250 mA	<.18µV/12dB	3.6(9.1)	2.3(5.8)	1.2(3.0)	9.1(260)	$389.95
IC-D1A	TriBand (see text)	13 VDC	2/2/1 W	1.9 A	210 mA	<.16µV/12dB	5.7(14.4)	2.3(5.8)	1.9(4.8)	20(635)	$1,199.95
IC-4iA	440-450 MHz	13.8 VDC	2.5/.02 W	1.2 A	250mA	<.18µV/12dB	3.6(9.1)	2.3(5.8)	1.2(3.0)	9.1(260)	$460.95
IC-2GXAT	144-148 MHz†	13.5VDC	3.0/1.0 W	1.8 A	250 mA	<.18µV/12dB	4.9(12.5)	2.2(5.7)	1.4(3.5)	13(365)	$359.95
IC-T21A	2m/440	13.5 VDC	60/.15 W	1.8 A	160 mA	<.16µV/12 dB	4.4(11.1)	2.1(5.4)	1.4(3.5)	11.1(315)	$399.95
IC-T41A	440/2m/440	13.5 VDC	60/.15 W	1.8 A	160 mA	<.16µV/12 dB	4.4(11.1)	2.1(5.4)	1.4(3.5)	11.1(315)	$472.95
IC-V21	2m/222 MHz	7.2 VDC	1.5 W	1.5 A	200 mA	<.16µV/12 dB	4.9(12.5)	2.2(5.7)	1.4(3.5)	14(390)	$783.95
IC-W2A	2m/440†	13.5VDC	2.0/.5 W	1.3 A	200 mA	<.25µV/12dB	6.7(17)	2.1(5.4)	1.4(3.6)	19(530)	$579.95
IC-W21AT	2m/440†	13.5VDC	2.0/.5 W	1.4 A	150 mA	<.16µV/12dB	4.8(12.5)	2.3(5.7)	1.4(3.5)	13(350)	$623.95
IC-2SRA**	2m#	13.8VDC	1.5/.5 W	1.3 A	250 mA	<.18µV/12dB	6.7(17)	2.1(5.4)	1.4(3.5)	13(350)	$612.95
IC-4SRA**	440-450 MHz#	13.8VDC	1.5/.5 W	1.3 A	250mA	<.18µV/12dB	6.7(17)	2.1(5.4)	1.4(3.5)	13(350)	$631.95
IC-X21AT	440/1200 MHz	13.8VDC	5.0/1.0 W	1.6/0.9 A	180 mA	<.16µV/12dB	4.9(12.5)	2.2(5.7)	1.4(3.5)	13(400)	$796.95
IC-12GAT	1.2 GHz	13.8VDC	1 W	.9 A	250 mA	<.25µV/12dB	5.1(13)	2.6(6.5)	1.4(3.5)	18(500)	$505.95
IC-P3AT	222-225 MHz	13.8 VDC	1.5/.5 W	1.6 A	250 mA	<.16µV/12 dB	4.1(10.5)	2.1(4.9)	1.5(3.9)	10(280)	$452.95

* Power with standard battery pack † Frequency coverage 138-174(receive only outside amateur bands), 440-450 MHz #Receive 25-905 MHz ** FM, Wide FM and AM

ICOM

HANDHELD ACCESSORIES

OPTIONS		2 METERS									DUAL and TRI BAND							440 MHZ						1200 MHZ	220 MHZ			
		2SAT	2GAT	2GXAT	2SRA	T21AT	2IA	02AT	P2AT	2AT	24AT	D1A	V21AT	W2A	W21AT	X21AT	X2A	4SAT	4GAT	4SRA	4IA	04AT	P4AT	12GAT	3SAT	03AT	P3AT	HRO Price
BATTERY PACKS	BP-3		*					*		std									*			std		*		std		$47.95
	BP-7		*					std											*			*		*		*		$87.95
	BP-8		*					*		*									*			*		*		*		$87.95
	BP-70		std					*											std			*		std		*		$82.95
	BP-81	*			*						*			*			*	*		*					*			$47.95
	BP-82	*			*						std			*			*	*		*					*			$60.95
	BP-83	*			*						*			*			*	*		*					*			$65.95
	BP-84	*			std						*			std			std	*		std					*			$87.95
	BP-85	*			*						*			|			*	*		*					*			$113.95
	BP-101											*			*													$68.95
	BP-102											*			*													$90.95
	BP-103											*			*													$104.95
	BP-111								std														std				std	$62.95
	BP-112								*														*				*	$68.95
	BP-113								*														*				*	$90.95
	BP-114								*														*				*	$104.95
	BP-121						std														std							$62.95
	BP-122						*														*							$64.95
	BP-123						*														*							$90.95
	BP-124						*														*							$104.95
	BP-131															*												$96.95
	BP-131A												*															$96.95
	BP-132															*												$109.95
	BP-132A			*									*															$99.95
	BP-157															*												$54.95
	BP-157A												*															$54.95
	BP-159					*																						CALL
	BP-160			*																								$21.95
BATTERY CASES	BP-4		*					*		*									*			*		*		*		$20.95
	BP-90	*			*						*			*			*	*		*					*			$20.95
	BP-100											*			*													$21.95
	BP-110								*														*				*	$21.95
	BP-120						*														*							$21.95
	BP-130											*				*												$21.95
	BP-130A			*									*															$21.95
	CM-12		*					*											*			*		*		*		$21.95
CABLES	CP-1		1					1		2									1			1		1		1		$21.95
	CP-11		3					*		2									3			*		3		*		$29.95
	CP-12	*							*		*							*					*		*		*	$21.95
	CP-13			*	*							*	*	*	*	*				*								$22.95
	CP-13L				*		*							*			*			*	*							$22.95
	OPC-254	*							*		*							*					*		*		*	$9.95
	OPC-288			*	*		*						*	*		*	*			*	*							$14.95
DC -CONV	DC-1									*																		$29.95
SPEAKER MICS	HM-46	*		*				*	*	*	*		*		*	*		*				*	*		*	*	*	$40.95
	HM-46L		*				*												*		*			*				$40.95
	HM-54	*		*				*	*	*	*		*		*	*		*				*	*		*	*	*	$55.95
	HM-55			*									*			*												$69.95
	HM-65				*							*		*	*		*			*								$42.95
	HM-70				*							*		*	*		*			*								$42.95
	HM-75												*		*	*												$55.95
HEADSET	HS-60				*							*		*			*			*								$76.95
	HS-51	*	*	*			*	*	*		4		*		*	*		*	*		*	*	*	*	*	*	*	$67.95
MOUNTING BRACKETS	MB-24		*																*					*				$29.95
	MB-25		*																*					*				$30.95
	MB-30	*		*	*				*		*	*	*	*	*	*	*	*		*			*		*		*	$29.95
INTERNAL OPTIONS	UT-40		*																*									$54.95
	UT-49	*		*														*							*			$54.95
	UT-50	std									*							*							*			$54.95
	UT-63												*		*	*												$82.95
	UT-70											std																$82.95
	UT-71											*																$54.95
	UT-72						std														std							$54.95
	UT-86			*																								CALL
OTHER OPTIONS	AD-12		*																*					*				$31.95
	AD-20				*									*			*			*								$32.95
	BA-10							*														*				*		$10.95
	BA-11	*			*						*			*			*	*		*					*			$8.95
	BA-12	*																*							*			$21.95

1 For charging BP-3, BP-5A, BP-7, BP-8, BP-70 2 Optional DC-1 is required 3 Optional AD-12 is required 4 Except for full duplex operation

HRO Staff Members Are Helpful Hams. They Speak Your Language.
They Know What Your Needs Are. Try Our Friendly Service.

Limited Quantities of 800 MHz Receivers

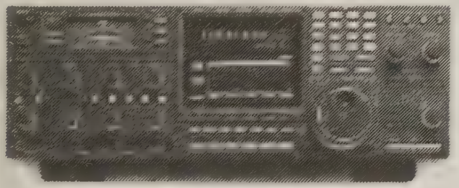
RECEIVERS

IC-R100

$803.95

Suggested List Price—Call for Quotes

This is a great full-coverage receiver for mobile operation. With FM, FM wideband and AM modes and frequency coverage of 100 kHz to 1.8 GHz, the IC-R100 tunes in all frequencies of interest. It has scanning, memory and priority features to locate stations quickly. It has 100 memory channels that store mode, RF attenuator and preamplifier setting. Other features include a 24 hour clock, 15dB preamplifier for 50-905 MHz, 20 dB RF attenuator, multiple tuning steps, all-mode squelch, AFC for frequencies above 50 MHz, automatic noise limiter, mobile mounting bracket, wire and telescoping antennas.



IC-R9000

$6509.95

Suggested List Price—Call for Quotes

Notice: Federal and State Government Agencies and Wire Communications Customers Only

Icom's top of the line IC-R9000 receives 100 kHz to 1999.8 MHz. Eleven separate bandpass filters use GaAs Fets for VHF and UHF bands. All modes include LSB, USB, CW, AM, FM, WFM (wide-FM) and FSK.

The receiver has Icom's unique, state-of-the-art multifunctional CRT display with spectrum scope. The display provides information on the status of the radio as well as the incoming signals.

The CRT display shows memory contents, dual clocks, weekly and daily timers, and frequency information of the dual VFO's. The display doubles as a spectrum scope showing a maximum of ±100 kHz. Dynamic range is 60 dB and sensitivity is approximately .63μV.

Other features include:

- 1000-channel memory stores mode, frequency, and tuning increments.
- Memory editor function moves and edits memory channels for storage in the most convenient locations.
- Multiple scanning functions: program scan, memory scan, selected memory scan, selected memory mode scan, priority scan, and voice scan control.
- New commands for computer control include AF gain control, RF gain control, squelch level control and S-meter needle reading.
- Uses Direct Digital Synthesizer (DDS) system for high speed PLL lockup.
- Direct keyboard entry; Notch filter and IF shift.

IC-R1

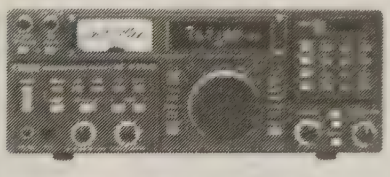
$589.95

Suggested List Price

Call for Quotes

Limited Supply w/Continuous Coverage

For people on the go, this compact receiver fits in a pocket. It covers 50 kHz to 905 MHz and receives AM, FM and FM wideband signals. To help find your favorite stations, there are 100 memories and a number of scanning features. Scan a frequency range or memories. With the memory skip function, only channels of interest will be searched. With the built-in timer, the IC-R1 will turn on at a specified time. When you go to sleep, the timer can be set to automatically turn the radio off. The IC-R1 uses most of the same accessories as the IC-2S series handhelds.



IC-R71A

$1328.95

Suggested List Price

Call for Quotes

This versatile, multifunction receiver was built for superior performance. It has an RF preamp, 100 dB dynamic range, selectable AGC, and tuning control or keyboard frequency selection.

Other features include:

- USB, LSB, AM, FM, RTTY and optional FM modes.
- Covers 100 kHz to 30 MHz.
- 32 memory channels.
- Programmed, memory and selected mode scan functions.
- Dual VFO's with three tuning rates and keyboard frequency entry.
- Adjustable IF notch filter & noise blanker.
- Built-in preamplifier and attenuator.
- Optional accessories: Remote control RC-11; Voice synthesizer EX-310.

Limited Supply w/Continuous Coverage

IC-R7100

$1647.95

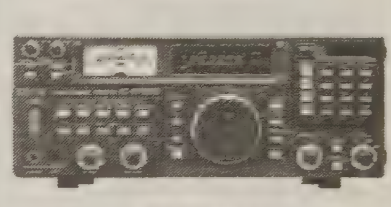
Suggested List Price

Call for Quotes

This VHF / UHF receiver provides continuous coverage from 25 to 2000 MHz.

Major features include:

- All mode capability (SSB, AM, FM and WFM).
- Dial and keyboard entry tuning.
- 900 numbered memory channels.
- Multiple scanning capabilities with new window scan.
- Built-in clock and timer operations.
- Optional TV receive capability.



IC-R7000

$1592.95

Suggested List Price—Call for Quotes

This receiver covers 25 - 1000 MHz in AM, FM, and SSB. There are 99 memory channels with lithium battery back-up. Direct keyboard frequency access or main tuning knob. Five tuning speeds and six separate tuning increments. Scan is memory or mode and programmable or priority. Features capability for computer control and has automatic tape recorder control. Other features are:

- Also tunes 1025 MHz to 2000 MHz with reduced sensitivity.
- 6 advanced scan functions including priority, programmed, selected memory, selected mode, memory and auto memory write. Variable scan speed and delay time.
- Noise blanker.
- Optional accessories: Voice synthesizer EX-310; Remote control RC-12; TV receive adapter TV-R7000.

ICOM

Triple-Band Mobile

NEW!

IC-D100

$1689.95

Suggested List Price
Call for Quote

Icom's tri-band, FM mobile transceiver for the 144, 440, and 1200 MHz amateur bands is compact, full of deluxe features, and yet easy-to-operate for driving safety.

The IC-D100 is designed with independent antenna connectors for each operating band (not displayed band) and a detachable front panel for installation flexibility.

The IC-D100 is for hams who:

- Want to operate 3 bands but do not want the inconvenience of installing 3 separate radios.
- Want the flexibility of a detachable front panel.
- Are in two ham families (memory bank feature).

The IC-D100 front panel can be mounted almost anywhere.

Remote Installation Options

The IC-D100 can be installed in one of three ways.

- One Body — install as a complete unit.
- Separate — detach the front panel and mount each part separately.
- Remote — mount the main body in the trunk (OPC-33 and OPC 335 required).

The IC-D100 has a number of features that are demanded by hams who want multiple band operation in a single, mobile rig. These include:

- **Tri-Band Mobile** - The IC-D100 has independent 144, 440 and 1200 MHz band units. Independent antenna connectors for the operating bands (not the displayed bands) allows connection of an external duplexer or triplexer.

- **Detachable Front Panel** - An optional OPC-332 or OPC-333 is required to use the front panel apart from the main body. Mount the front panel in an easy-to-see location and keep the main body out of the way in the trunk.

- **Versatile Transmit and Receive Operations** - Each display band can freely select the operating band. This allows simultaneous receive of 3 signals in the 440 MHz band and 2 signals on the 144 MHz band while monitoring 440 MHz.

- **4 Levels of Digital Squelch** - Each band has separate controls for 4 levels of automatic digital squelch to allow independent settings. 34 levels of squelch are provided for each band. In addition, auto squelch function can be used to set the squelch to each band's threshold point automatically.

- **Multifunction DTMF Microphone** - The DTMF microphone provides added operating convenience with full access to all functions.

- **642 Memory Channels** - The IC-D100 has an unprecedented 642 memories to store all required information. These are NORMAL memories for storing frequency, repeater information, tone, squelch and skip (600). SCAN EDGES for storing program scan (12). CALL for storing frequencies, repeater, tone and squelch information.

- **Other features include** - independent dials and switches; multiple scan options including full scan, programmed scan, memory scan and priority scan; set mode capability to customize the rig to suite your needs; multiple tuning steps; dual or mono band operation; sub-band access function; sub-band busy beep; front panel lock; optional pager and code squelch function (UT-75 required); optional voice synthesizer (UT-66); 3 external speaker jacks; partial reset; audio mute function; powerful cooling fan; one-touch PTT with time-out timer function.

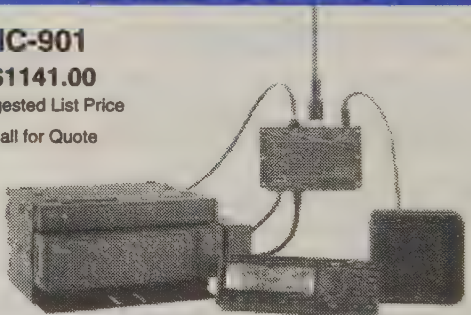
Multi-band Mobile

IC-901

$1141.00

Suggested List Price

Call for Quote



Icom's sophisticated multi-band FM mobile transceiver is perfect for customized installations. Place the main body in any convenient, out-of-the-way place while keeping the detachable remote controller in a location near you.

Major features include:

- 2 m and 440 MHz built-in. Add 2m SSB with optional UX-S92.
- Simultaneous dual-band reception. Expanded receive coverage for 2m (138-174 MHz). Transmit 140-150 MHz.
- Optional receive unit, UX-R91, for selected frequencies from AM broadcast through 900 MHz.
- Remote head connected to main unit by the optional fiber optic cable.
- Full-duplex cross-band operation.
- Band stacking capabilities with up to 5 optional band units. 10 m: UX-19A; 6 m: UX-59A; 220 MHz: UX-39A; 1.2 GHz: UX-129A.
- Output power 50 watts on 2m and 35 watts on 440 MHz.

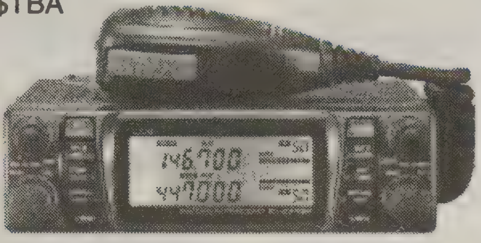
VHF / UHF MOBILES

Dual-Band Mobiles

IC-2340A / IC-2340H

$TBA / $TBA

NEW!



These easy-to-operate dual-band FM mobile transceivers are perfect for FM newcomers and experienced amateurs alike. They are designed especially for convenient operation while driving.

Major features include:

- Easy operation.
- 100 memory channels, 50 for each band storing operating frequency, offset direction, offset frequency, tone squelch (optional UT-89 required) and tone frequency.
- Independent tuning knobs and switches for each band.
- On the "H" model 45W output on 2m and 35W on 70 cm. "A" Model is 25 watts on each band.
- Programmable tone encoder
- Programmable band and memory scanning.
- Full-duplex operation for cross-band operation.

IC-2700H

$TBA

NEW!

This compact, multi-functional dual-band (2m and 70 cm) FM transceiver is full featured and easy to operate. The front panel is detachable for installation flexibility. Major features include a 3-channel log memory and repeater memory, separate controls for each band, full remote control microphone and optional infrared wireless microphone. It features multiple scanning functions with 100 memories. 20 to 80 memories can be allocated in steps of 10 to the bands with a maximum of 100 total allocated. Four levels of digital squelch are available. Output power on 2m is 50 watts and 35 watts on 70 cm.

IC-2330A

$911.00

Suggested List Price—Call for Quote

While hiking, fishing, shopping or in any remote place, you can transmit / receive with your handheld through the IC-2410 in your vehicle. This dual-band mobile is fully remotable (optional UT-55 and UT-66 are required) from its mike or any handheld with DTMF. Hear two signals simultaneously on the same or different bands. Extended receive operation and 36 memories. UT-67 tone squelch is an optional accessory.

Single-Band Mobiles

Dual Receive

IC-281H

$462.95

Suggested List Price—Call for Quote

NEW!

Icom's IC-281H is a 2 meter mobile transceiver with 440 MHz receive capability. This enables full duplex, crossband operation between the 2 meter and 70 cm with crossband repeat from 440 MHz to 2m. A DATA jack connects a TNC directly to the modulation unit for up to 9600 bps packet.

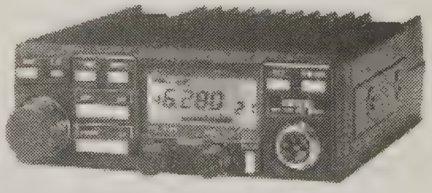
Features include:

- 50 watts output; three RF output power settings.
- 50 regular memory channels store frequency, offset, tone, duplex shift direction. 10 scratch pad memories store 10 previous transmit frequencies for instant recall.
- Automatic memory channel advance to enhance the programming process.
- Built-in pager and code squelch functions.
- Optional tone scan when you do not know the tone frequencies (optional UT-85 required).
- Multiple scan functions: programmed, priority watch, memory skip.
- Optional voice synthesizer (optional UT-66 required).
- Auto power off function.

IC-449A

The IC-449A for 440 MHz is full featured with 20 memory channels and multiple scanning functions. Tone squelch and paging options are available. Output power is 35 watts. **Suggested List $599.95**

IC-28H



$459.95

Suggested List Price—
Call for Quote

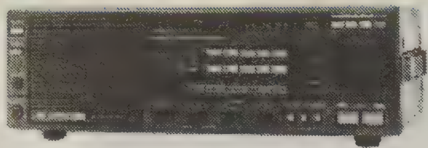
This easy-to-use, compact 2 meter FM mobile is simple to install. The 45 watt IC-28H features 21 memories, scan functions and a large display. All functions can be easily controlled with just a few switches and controls insuring your safe driving.

Major features include:

- 45W output.
- 21 memories.
- VFO and memory scan.
- Memory skip function.
- Memory transfer function.
- DTMF microphone.
- Built-in subaudible tone encoder.
- Selectable tuning step.

KENWOOD

Receivers



R-2000

$849.95

Suggested List Price—Call for Quote

This innovative all mode USB, LSB, CW, AM, FM receiver covers 150 kHz to 30 MHz. With the optional VC-10 VHF converter unit, coverage is extended to include 118 - 174 MHz. This is the perfect general coverage receiver for the individual who is serious about the hobby but is still on a budget.

Major features include:

- Digital VFO with 50 Hz step tuning. Variable tuning speeds of 50 Hz / 500 Hz / 5 kHz.
- Ten memories store frequency and mode data.
- Memory and programmable band scan capabilities.
- Dual 24 hour quartz clocks with a timer.
- Three built-in filters with wide / narrow selector switch.
- Squelch circuit on all modes.
- Built-in noise blanker.
- AGC switch for fast and slow.
- Built-in AC power supply. 110V or 220V switchable.
- 12 VDC with the optional DCK-1.

R-5000

$1179.95

Suggested List Price—Call for Quote

The R-5000 is a competition class communications receiver having every conceivable feature required by the serious shortwave listener. It is designed to receive all modes (LSB, USB, AM, CW, FM) from 100 kHz to 30 MHz. With the optional VC-20 converter unit coverage is extended to include 108 - 174 MHz. (VC-20 installed by dealer.)

Major features include:

- 102 dB dynamic range.
- 10 Hz step dual VFO's for SSB, FSK and CW. 100 Hz for AM and FM. VFO's operate independently.
- Dual high and low impedance antenna terminals.
- Keyboard frequency selection for direct entry.
- 100 memory channels store frequency, mode and antenna selection.
- Memory and programmable band scan.
- Dual 24 hour clocks with timer.
- Built-in AC power supply.
- 110 VAC only; UL approved.
- 12 VDC operation with the optional DCK-2.

HF and 6M Mobile

TS-50S TS-60S

$1279.95 $1209.95

Suggested List Prices—Call for Quotes

The TS-50S and TS-60S are the latest compact transceivers from Kenwood. The TS-50S is for HF and the TS-60S is for 6 meters only. They feature all-mode operation (AM, CW, SSB and FM) with 100W (90W TS-60S) on CW/SSB/FM and 25 watts on AM. The general coverage receiver on the TS-50S covers 500kHz to 30MHz.

They have RIT, IF Shift, noise blanker and scanning functions. It features 2 VFO's and 100 memories. The compact size and weight makes it the perfect mobile or traveling rig.

Features include:

- TS-50S has a 500 kHz - 30 MHz general coverage receiver (not available on TS-60S).
- Dual VFO's.
- DDS with "Fuzzy" Control Logic.
- Speech processor.
- Weighs only 6.4 pounds.
- Full break-in / semi break-in.
- Convenient menu programming.
- All mode squelch and CTCSS encode built-in (TS-60S).
- Automatic gain control (slow / fast).
- IF shift and TF-set.

Kenwood HF Specifications

		Power Supply		Current Drain		Power											
Model	Receiver Frequency Range	50/60 Hz AC	DC	Xmit	Rec	AM	FM	SSB	CW	FSK	FSK Shift	Mike Z	Receive Circuitry	Sensitivity	RIT / XIT	Notch Filter	Audio
TS-950S	100 kHz - 30 MHz	120/220/240 V		700 W max	80 W	40	150	150	150	150	170 Hz	500 Ω-50 kΩ	Quadruple Conversion	<.2µV SSB,CW,FSK	±9.99 kHz	> 45 dB	1.5 W
TS-850S	100 kHz - 30 MHz		13.8 V	20.5 A	2 A	40	100	100	100	100	170 Hz	500 Ω-50 kΩ	Quadruple Conversion	<.2 µV SSB, CW, FSK	±9.99 kHz		1.5 W
TS-450S	500 kHz - 30 MHz		13.8 V	20.5 A	2.1 A	40	100	100	100	100		500 Ω-50 kΩ	Triple Conversion	< .25 µV	>±1.1 kHz	20 dB	1.5 W
TS-140S	500 kHz - 30 MHz		13.8 V	20 A	1.5 A	40	50	100	100		-	500 Ω-50 kΩ	Double Conversion	< .25 µV at 10 dB	±1.2 kHz	-	1.5 W
TS-690S	500 kHz - 30 MHz & 6m		13.8 V	20.5 A	2.1 A	40†	100#	100#	100#	100#	-	500 Ω-50 kΩ	Triple Conversion	<.25 µV at 10 dB**	>±1.1 kHz	20 dB	1.5 W
TS-50S	500 kHz - 30 MHz		13.8 V	20.5 A	1.5 A	25	100	100	100			600 Ω	@	< .25 µV	>±1.1 kHz		2 W
TS-60S	50 - 54 MHz		13.8 V	20.5 A	2.0 A	25	90	90	90			600 Ω	@	< .25 µV			2 W

* Input Power ** 6m <.16µV at 10 dB †20W Out at 6m # 50 W Out at 6m @ Double Conversion SSB, CW, AM; Triple FM

HF TRANSCEIVERS

TS-450S TS-690S

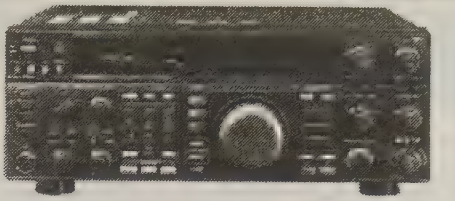
$1439.95 $1699.95

Suggested List Prices—Call for Quote

These compact models give you competition class reception and 100W transmission capabilities across all nine HF bands. The TS-450SAT incorporates an automatic antenna tuner for easy antenna coupling. The TS-690S has the same features as the TS-450S plus the 50 MHz band.

The major features include:

- 500 kHz - 30 MHz general coverage receiver on TS-450S plus 50-54 MHz on TS-690S (MARS modifiable).
- 160 - 10 meter amateur operation on TS-450S; plus 6 meters on TS-690S.
- All modes USB, LSB, CW, AM, FM and AFSK.
- Advanced Intercept Point (AIP) for improved dynamic range.
- Dual VFO's. RIT / XIT.
- IF Shift and selectable IF filter.
- Full break-in for CW with CW reverse.
- Tunable AF notch filter, dual-mode noise blankers and RF attenuator.
- Multiple filter options selectable from the keypad.
- 10 Hz dial resolution.
- Multiple scanning functions.
- 100 memory channels.
- Switchable AGC (slow or fast).
- Optional internal automatic antenna tuner for 80 - 10 meter operation.
- 100% duty cycle transmitter.
- Speech processor.



TS-850S TS-850S / AT

$1949.95 $2149.95

Suggested List Prices—Call for Quote

This HF transceiver is a 12 volt high performance transceiver with a general coverage receiver of the TS-950SDX calibre. It is available with or without the internal automatic antenna tuner.

Major features include:

- 160-10 meter amateur operation (MARS modifiable).
- General coverage receiver 150 kHz - 30 MHz.
- SSB IF slope tuning with independent High & Low Cut control.
- IF notch filter. Audio Filter.
- Optional external AC power supply PS-52.
- Full and semi break-in CW. Fine tuning on CW.
- 100 memory channels store receive and transmit frequencies. Keyboard frequency entry.
- RIT / XIT.
- Dual mode noise blanker; RF attentuator; switchable AGC.
- Optional DSP-100 Digital Signal Processor converts audio signals to digital information for cleaner SSB and CW signals.
- Speech processor, RIT / XIT, keyer, 10 HZ dial resolution.

TS-140S

$1079.95

Suggested List Price - Call for Quote

The TS-140S provides SSB, CW, AM and FM operation on all HF amateur bands. This compact and affordable radio can be used for mobile as well as base operation. With its price and features, it is the perfect back-up radio or first novice rig.

Features include: 500 kHz - 30 MHz general coverage receiver; independent dual VFO's.; Multiple scanning capabilities; 10 of the memories store transmit and receive frequencies independently. Allows for repeater operation; Speech processor; CW full break-in.

TS-950SDX

$4799.95

Suggested List Price—Call for Quote

The TS-950SDX is Kenwood's top-of-the line HF transceiver. The state-of-the-art design includes Digital Signal Processing (DSP), high power MOSFET-type finals, simultaneous dual-receive and much more.

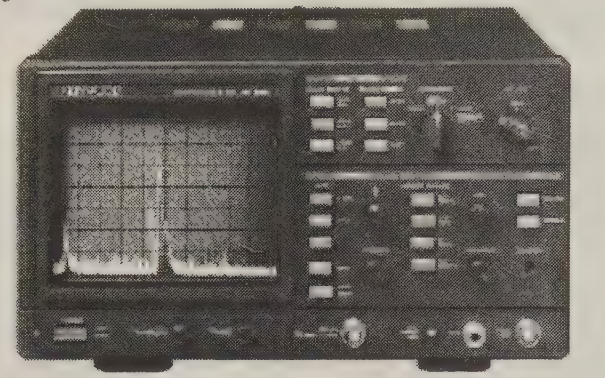
The major features include:

- 100 kHz - 30 MHz general coverage, quadruple conversion receiver with 100 memories.
- 160 - 10 meter amateur operation (MARS modifiable).
- High power output utilizing rugged MRF150MP finals.
- Built-in automatic antenna tuner 160 - 10 meter, dual digital VFO's, direct band key access, illuminated keyboard, memory channel / VFO control, multiple scan functions and RIT / XIT.
- Built-in AF digital filter, multi-drive bandpass filter, dual noise blankers, IF filters, selectable IF filter in memory, 4-position RF attenuator, & auto-AGC.
- CW features include full and semi break-in electronic memory keyer, variable pitch control and selectable CW filters.
- Easy split -frequency operation.
- "Menu-Driven" control of various functions.
- Includes RM-1 remote keyboard.
- Separate S-Meter and speaker output for the sub-receiver.
- Front panel control of DSP.
- Fine tune in 1Hz steps.
- Optional DRU-2 Voice Memory device available for SSB contest use.
- 500Hz CW filter in sub-receiver.

KENWOOD

Station Monitor

The station monitor in Kenwood's accessory line monitors both transmit and receive signals on the TS-950S and TS-850. The SM-230 can be used to monitor only your transmitted signal on other Kenwood and other manufacturer's HF rigs.



SM-230

$1099.95

Suggested List Price—Call for Quote

The SM-230 station monitor is a peripheral to the TS-950 HF transceiver. Using a 6 inch square CRT, it is a multi-function monitor scope with oscilloscope, band scope, monitor scope, RTTY cross pattern observation, and tone generator. Its frequency range is 1.8 - 150 MHz.

Other features include:

- 6 step attenuator.
- Maximum input power 2 kW PEP to 80 MHz and 100 W PEP to 150 MHz.
- Dual Watch marker function.
- 3 bandwidths: 50 kHz, 200 kHz and 500 kHz.
- Built-in interface for the TS-950. No options are needed.

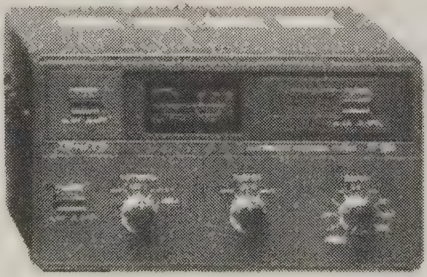
Antenna Tuners

AT-450

The AT-450 is an automatic antenna tuner that can be provided as an option for the TS-450S and TS-690S. The installation can be easily accomplished with only a screwdriver. The tuner only works with the TS-450S and TS-690S and covers 80 - 10 meters. **HRO Price $219.95**

AT-50

A fully automatic antenna tuner to use with the TS-50 and other 100 watt HF transceiverws. It is usefulfor both mobile and fixed operation. Accurate tuning by pressing the AT TUNE key on the TS-50. Can be installed remotely. **Suggested List $354.95**



AT-300

The AT-300 is a specialized antenna tuner that can be used with the new TS-450S for mobile or marine operation. It can be used to automatically tune a whip or random length of wire. **HRO Price $599.95**

Power Supplies

PS-31

The PS-31 power supply is designed especially for the TS-790A satellite transceiver. The supply is for 110 VAC only and provides 13.8 VDC output. The rating is 20 A at a 25% duty cycle and 15 A at a 50% duty cycle. The supply may also be used for operation of HF radios. The power connector matches most all the other Kenwood HF radios. **Suggested List Price $219.95**

PS-52

The PS-52 power supply has been designed specifically to power the TS-850. The PS-52 is a heavy duty supply that will operate all modes of the TS-850 for the rated periods of time. The supply provides 13.8 VDC at 22.5 A. The PS-52 features a cooling fan and protection circuits. **Suggested List Price $289.95**

PS-53

The PS-53 power supply has been designed specifically to power the TS-450S and TS-690S. The PS-53 is a heavy duty supply that will operate all modes for the rated periods of time. The supply provides 13.8 VDC at 20.5 A. The PS-53 features a cooling fan and protection circuits. **Suggested List Price $269.95**

HF Linear Amplifier

TL-922A

$2099.95

Suggested List Price—Call for Quote

The TL-922A is an HF linear amplifier designed to provide near maximum legal power on the amateur bands. It utilizes two 3-500Z high-performance tubes. The TL-922A may be modified by the amateur for 10 meter operation. Please provide a copy of your amateur license when requesting the modification instructions.

Major features include:

- Class AB_2 grounded-grid circuit.
- Cooling fan power-off delay circuit and safety protection provisions on the cabinet.
- Dual meters for proper amplifier adjustment.
- Covers 160 - 15 meters. 10 meters with user modification.
- Variable threshold ALC circuit.
- Drive required is 80 watts or more.
- Power requirements 120 / 220 VAC, 50 / 60 cycle.
- ALC negative-going adjustable threshold with -8 VDC maximum.
- Shipped by truck, air freight, RPS and UPS to some areas.

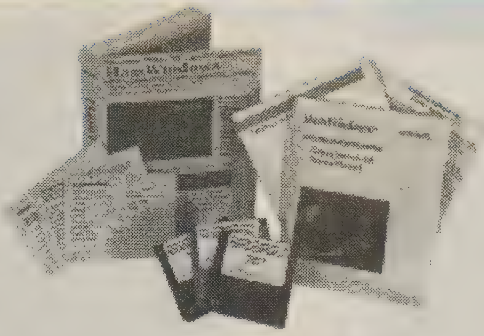
Software

Ham Windows™

What you get with any HamWindows product is Amateur Radio as you have never experienced, and cannot experience any other way:

- A visual interpretation of your amateur radio operations using your Kenwood rig.
- Operational advantages over normal radio operations made possible by select program features.
- A database of information on other countries, radio operators and much more.

The link between a Kenwood rig and a PC comes via a series of three computer software programs that can open new windows of discovery. Each offers you a unique experience and incredible operating potential.

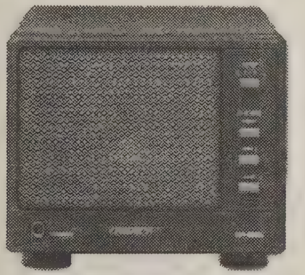


- **HamWindows Radio Construction Set (HF,VHF)** is a low-cost entry level program that gives you a glimpse at the power and advantages of PC/Kenwood operations. **Suggested List Price $49.95**
- **HamWindows 2.3 (HF,VHF)** is an assortment of full color windows that contain your station log, a world almanac, awards tracking and more. **Suggested List Price $139.95**
- **HamWindows Plus 3.0 (HF,VHF)** provides VHF control in addition to HF. SVGA compatibility, new awards and more. **Suggested List Price $162.95**

All HamWindows require Windows 3.1

Speakers

Kenwood has a number of external speakers for HF and VHF/UHF mobile and base stations. The top of the line speakers have built-in audio filters.



SP-950

The **SP-950** is the base station speaker with cabinet styling that matches the TS-950S and TS-950SDX. The speaker has the ability to select two radio inputs and has high and low filter switches. The high filter switch attenuates frequencies above 3.0 kHz and 1.3 kHz respectively. The low switch attenuates frequencies below 400 Hz. The speaker has a separate headphone jack on the front panel and a line output for packet, RTTY or SSTV. **HRO Price $114.95**

Kenwood has added another speaker to especially match the TS-450S and TS-690S. It is the **SP-23** speaker. **HRO Price $79.95**

The **SP-31** is the speaker especially designed for the TS-850. It can select one of two audio inputs, high and low filters and a separate headphone jack. **HRO Price $94.95**

There are two mobile speakers, the **SP-41 ($44.95)** and the **SP-50B ($47.95)**. The SP-41 is a small square speaker and the SP-50B is a thin rectangular speaker. Both are provided with an assortment of mounting accessories for mobile use.

Kenwood HF Accessories

Option	Model	950 SDX	940S	930S	850S	450S 690S	440S	430S	140S 680S	50S	60S	Sugg. List
Microphone												
Hand	MC-43S	std	std	std	std	std	std	std	std	*	*	$53.95
Hand	MC-47									std	std	$54.95
Desk	MC-60A	*	*	*	*	*	*	*	*	*	*	$144.95
Desk	MC-80	*	*	*	*	*	*	*	*	*	*	$99.95
Desk	MC-85	*	*	*	*	*	*	*	*	*	*	$154.95
Desk	MC-90	*										$244.95
Filters												
250Hz CW	YG-455CN-1	*	*	*	*	*						$174.95
500Hz CW	YG-455C			*								$119.95
500Hz CW	YG-455C-1	std	*	*	*	*			*			$159.95
500Hz CW	YK-455C-1					*			*			$109.95
6kHz AM	YK-88A							*				$80.95
6kHz AM	YK-88A-1		*	*								$99.95
500Hz CW	YK-88C						*	*				$99.95
500Hz CW	YK-88C-1	std	*	*	*	*						$109.95
270Hz CW	YK-88CN						*	*				$99.95
270Hz CW	YK-88CN-1	*			*	*						$94.95
1.8kHz SSB	YK-88SN		*				*	*				$99.95
2.4kHz SSB	YK-88S-1					*						$99.95
1.8kHz SSB	YK-88SN-1	*			*	*						$94.95
2.4kHz SSB	YK-88S						*					$92.95
500Hz CW	YK-107C						*				*	$109.95
High Stability Oscillator	SO-1		*									CALL
	SO-2	std			*	*				*	*	$169.95
Headphones	HS-5	*	*	*	*	*	*	*	*			$74.95
	HS-6	*	*	*	*	*	*	*	*			$54.95
External Speaker	SP-41						*	*	*			$44.95
	SP-31				*							$94.95
	SP-50B						*	*	*	*	*	$47.95
	SP-23					*						$79.95
	SP-950	*										$124.95
HF Linear Amplifier	TL-922A	*	*	*	*	*	*	*	*			$2,099.95
Phone Patch	PC-1A	*	*	*	*	*	*	*	*			$124.95
Voice Synthesizer	VS-1		*				*					$65.95
	VS-2	*			*	*						$67.95
Station Monitor	SM-230	*	*	*	*	*	*	*	*	*		$1,099.95
Antenna Tuner	AT-50									*		$354.95
	AT-300				*	*				*		$669.95
	AT-450					*						$234.95
	AT-850				*							$234.95
Mobile Mount	MB-13									*	*	$47.95
	MB-430					*	*	*	*			$43.95
Power Supply	PS-33					*	*	*	*	*	*	$239.95
	PS-52				*							$289.95
	PS-53					*				*	*	$269.95
Digital Signal Processor	DSP-100				*	*						$669.95
Voice Memory	DRU-2	*			*							$134.95

KENWOOD

All Mode Mobiles

TM-255A
2 Meters
$1109.95

TM-455A
70 cm
$1279.95

Suggested List Prices—Call for Quotes

The new all mode transceivers after a new innovative family of radios. The TM-255A (144 MHz) and TM-455A (440 MHz) feature a detachable front panel for easy mounting in any vehicle.

Major features include:

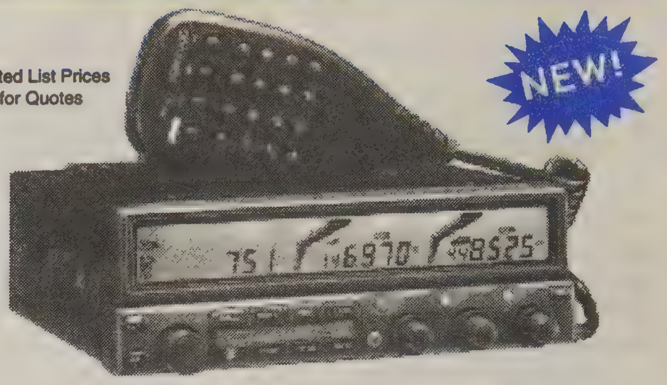
- 40 watts (TM-255A) and 35 watts (TM-455A) output with high / low switch.
- Operates in FM, SSB, and CW.
- 101 memories.
- 6-pin mini connector for 1200/9600bps packet.
- Twin tuning with dual menu system.
- IF Shift (SSB and CW).
- DDS (Direct Digital Synthesis) with fuzzy logic control.
- Tone alert with elapsed timer.
- Built-in CTCSS encoder. Optional TSU-8 tone decoder.
- Built-in TX temperature compensated crystal oscillator
- Pulse noise blanker.
- Multiple scanning functions.

Ham Radio Outlet Accepts

DISCOVER MasterCard VISA

Multi- Band FM Mobiles

Suggested List Prices
Call for Quotes



TM-642A	**TM-742A**	**TM-942A**
$929.95	**$929.95**	**$1279.95**

This multi-band FM transceiver family has a radio that will satisfy the most demanding multi band needs of the mobile radio amateur. The design provides dual band (144 / 440 MHz) or (144 /220 MHz) operation with the capacity to expand to triple band operation by adding optional 28 MHz, 50 MHz, 220 MHz, or 1200 MHz modules.

Major features include:

- Extended 2 meter receive coverage from 118 - 174 MHz.
- 50 W output on 2 meters and 35 W on 440 MHz.
- The TM-942A covers 2 meters / 440MHz / 1200MHz at 50W / 35W / 10W The TM-642A cover 144 MHz and 220 MHz at 50 W/ 25W.
- Optional band units for 28 MHz, 50 MHz, 220 MHz and 1200 MHz tri-band operation.
- Multiple scanning modes including band scan, programmable band scan, memory scan, MHz scan, call-VFO-memory scan, call-VFO scan, auto memory scan.
- Direct frequency input to the VFO using the supplied DTMF microphone.
- Independent receive function with display for each band. Receives all installed units at the same time. Choice of single, dual or triple band operation. Selectable full (triple band) cross-band operation is available.
- 100 memory channels plus a call channel for each band. Each memory stores frequency, tone, CTCSS, step, shift, rev, DTSS and pager information. Each memory will store both transmit and receive frequency for odd offsets.
- Built-in DTSS with pager function. Built-in encode function. Decode requires the optional TSU-7
- Remote front panel mount kits optional. DFK-3 for interconnecting knob panel to LCD panel, DFK-4 contains 13 foot panel cable, and DFK-7 for 22 foot separation with longer power cord and three audio cables.

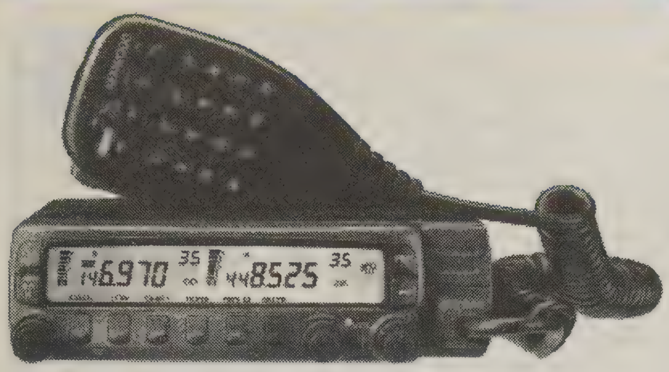
Limited Quantity

TM-641A
$929.95
Suggested List Price

This multiband transceiver is still available for 2m and 220 MHz. Additional band modules can be added. See your HRO representative for details.

VHF/UHF MOBILES

Dual-Band Mobiles



NEW!

TM-733A

$749.95

Suggested List Price—Call for Quote

The TM-733A FM dual bander is specially tailored for hassle free mobile communications with a unique "6-in-1" programmable memory. Six entire operating profiles - including everything from frequency range to dimmer level - can be stored for instant recall. The transceiver is packed with a complement of sophisticated features.

Major features include:

- Dual receive on the same band.
- 50 watts output on 2 meters (144 - 148 MHz), 35 watts output on 70 cm (438 - 450 MHz).
- 72 memory channels.
- Time-operated and carrier operated scan stop modes.
- Built-in DTSS selective calling with page.
- Multi-Function Scanning allows band scan, memory scan and even memory channel lockout.
- Built-in CTCSS encoder with optional TSU-8 decoder.
- Wireless clone function.
- S-meter squelch.
- Tone alert system with elapsed time indicator.
- Separate speaker terminals for each band (switchable)
- Multifunction DTMF microphone supplied.
- Repeater reverse and offset switch
- Auto repeater offsets (144 MHz).

TM-732A

$769.95

Suggested List Price—Call for Quote

The TM-732A is an ultra-compact FM dual-band (2m/70cm) transceiver. It has multiple mounting options for the detachable front panel display and a multifunctional microphone making the TM-732A ideal for today's small cars.

Single-Band FM Mobiles

NEW!

TM-251A
2 meters
$529.95

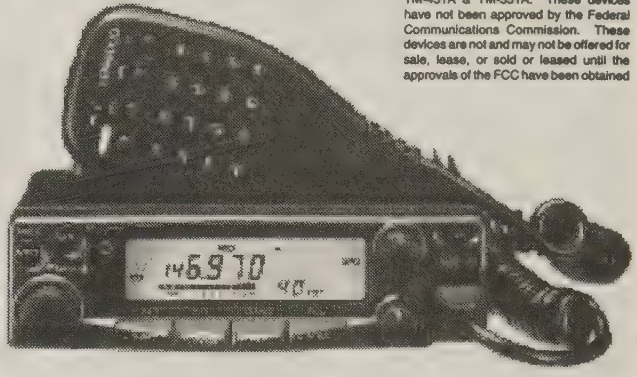
TM-451A
70 cm
TBA

TM-331A
220 MHz
$519.95

TM-551A
1.2 GHz
TBA

Suggested List Prices—
Call for Quotes

TM-451A & TM-551A. These devices have not been approved by the Federal Communications Commission. These devices are not and may not be offered for sale, lease, or sold or leased until the approvals of the FCC have been obtained

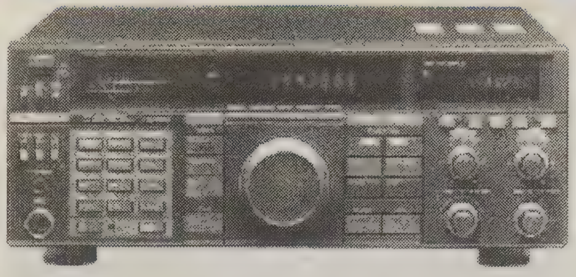


These new compact single-band FM transceivers from Kenwood are available for 2 meters, 220 MHz, 70 cm or 1.2 GHz. The TM-251 also covers the aircraft frequencies on receive.

Major features include:

- 41 multifunction memory channels storing frequency (200 with optional ME-1), repeater offset, CTCSS frequency. Encode built-in. Decode with optional TSU-8.
- High power output. 50 W (TM-251A), 25 W (TM-331A), 35 W (TM-451A) and 10 W (TM-551A).
- TM-251A is for 2 m with a 70 cm receiver; TM-451A is for 70 cm and includes a 2 m receiver; TM-551A is for 1200 MHz with a 70 cm receiver.
- Multifunctional microphone allows control of the major functions of the radio right from the microphone. Microphone includes a 16 key DTMF pad.
- Automatic offsets on the TM-251.
- Dual menu system, DTSS with page and S- meter squelch.
- 6-pin mini DIN connector (1200/9600bps packet) (Not with TM-331A).
- Fuzzy logic control for tuning.
- Auto power off and time out function.
- Band scan, program scan, memory scan, call scan.
- Fixed band and same band repeater functions (cross-band repeat)..
- Built-in digital recording system.
- 10 DTMF memory (15 digits)

VHF / UHF All Mode



TS-790A

$2149.95

Suggested List Price—Call for Quote

The TS-790A was designed to be the ultimate in VHF / UHF all-mode operation. Special features make it easy to use as an Oscar station.

Major features include:

- Operates all modes SSB, CW, FM.
- 2m and 440 MHz are standard with dual displays.
- Selectable AGC (fast / slow).
- Dual VFO with tracking.
- Receives 140-168 MHz. Modifiable for MARS / CAP transmitting.
- IF shift, RIT, noise blanker, and dual watch.
- Channelized tuning for normal FM repeater operation.
- 59 memories with alert and call channels.
- Standard and non-standard channel splits can be stored in memories.
- Optional 1.2 GHz with UT-10.
- Optional VS-2 voice synthesizer and optional TSU-5 decode unit.
- External 13.8 VDC power supply is required such as the Kenwood PS-31.

1993 Best Sellers

During the past 12 months, Ham Radio Outlet and Kenwood have both reached new horizons in amateur radio. Ham Radio Outlet is proud to state that the Kenwood radios on this catalog's front cover were the "1993 Best Sellers" in their class at HRO!

With HRO's 12 stores serving hams across the U.S.A. and worldwide, coupled with Kenwood's pacesetting product designs like the revolutionary TS-50S and the "New" TM-733A, it's clear the easy choice is Kenwood and Ham Radio Outlet for the best products and the best service!

Kenwood VHF / UHF Specifications

Model	Power Supply	Current Drain					
	DC	Transmit	Receive	Output Power	Sensitivity	RIT/XIT Range	Sugg. List
TM-251A	13.8 V			50 W			$529.95
TM-331A	13.8 V			25 W			$519.95
TM-451A	13.8 V			35 W			TBA
TM-551A	13.8 V			10 W			TBA
TM-641A**	13.8 V	11.5 A	1.2 A	50V/25††	<.16 µV		$929.95
TM-642A**	13.8 V			50V/25††	<.16 µV		$929.95
TM-732A	13.8 V	11.5 A	0.8A	50V/35U	<.16 µV		$769.95
TM-733A	13.8 V			50V/35U			TBA
TM-742A	13.8 V	11.5 A	1.2 A	50V/35U	<.16 µV		$929.95
UT-28S**				50 W			$339.95
UT-50S**				50 W			$339.95
UT-220S**				25 W			$339.95
UT-1200**				10 W			$439.95
TM-255A	13.8 V			40 W			TBA
TM-455A	13.8 V			35 W			TBA
TS-790A	13.8 V	15 A	2.5 A	*	<.22 µV †	±9.9 kHz #	$2,149.95
TM-942A	13.8 V	11.5 A	1.2 A	@	<.16 µV		$1,279.95

† SSB/CW < .16 †† 220 MHz # SSB/CW ± 1.9

* VHF FM/CW 45 W; UHF FM/CW 40 W; 1200 MHz FM/CW/SSB 10W; VHF SSB 35 W; UHF SSB

**These modules used by TM-641, TM-942, TM-741A also.

@ VHF 50W; UHF 35W; 1200 MHz 1

Kenwood Power Cables

Part Number	Radio	HRO Price
PG-2X	TS-140, 690, 790, 450, 850, 130, 440	$29.95
PG-2N	TM-2530/50/70, 721, 621A, 221/321/421, 241, 231/431/531, 251/451/551, 255/455,441, 201B, 401B, 541, 631, 642A,731, 741, 941, 732A, 733A, 642A,742A, 942A, TR-751A	$13.95
PG-2W	TH-26, 46, 28, 48	$14.95
PG-2Y	TS-50S/60S	$34.95
KLF-3	TH-26, 27, 46, 47	$23.95
PG-3H	TH-28, 48, 78	$29.95

Handheld Battery Packs / Chargers

Battery	Voltage	Rating MAH	Desk Charger	Radio Series	HRO Price
KNB-5A	7.2	800	KSC-7/8	TH-25/26/45/46/55/75/77	$76.95
KNB-6A	7.2	1100	KSC-7/8	TH-25/26/45/46/55/75/77	$97.50
KNB-7A	12	800	KSC-7/8	TH-25/26/45/46/55/75/77	$76.95
PB-5	7.2	200	KSC-7/8	TH-25/26/45/46/55/75/77	$59.95
PB-9	7.2	600	KSC-7/8	TH-25/26/45/46/55/75/77	$70.95
PB-12	12	500	BC-7	TH-205/215/225/315/415	$66.95
PB-13	7.2	700	BC-15A	TH-27/47/28/48/78	$63.95
PB-14	12	300	BC-15A	TH-27/47/28/48/78	$89.95
PB-17	12	700	BC-15A	TH-27/47/28/48/78	$99.95
PB-18	7.2	1100	BC-15A	TH-27/47/28/48/78	$86.95
PB-21	7.2	180	N/A	TH-21/31/41	$29.95
PB-21H	7.2	500	N/A	TH-21/31/41	$49.95
PB-24	9.6	500	N/A	TR-2400	$54.95
PB-26	8.4	450	ST-2	TR-2500/2600	$64.95
PB-30	4.8	600	KSC-14	TH-22AT/42AT	CALL
PB-32	6	600	KSC-14	TH-22AT/42AT	64.95
PB-33	6	1200	KSC-14	TH-22AT/42AT	89.95
PB-34	9.6	600	KSC-14	TH-22AT/42AT	89.95

Kenwood VHF Accessories

Option	Model	211A 411A	221A 321A 421A 521A	231A 331A 431A 531A	241A 441A 541A	251A 451A 551A	255A 455A	711A 811A	751A 851A	2530A 2550A 2570A	4100A	621A 721A	631A 731A	732A	733A	642A 742A 942A	641A 741A	941A	HRO Price
Microphone																			
Hand	MC-43S	*	*	*				*	*	*	*	*	*						$53.95
Hand	MC-44DM		*	std	std								std						$74.95
Hand	MC-45													*		*	*	*	$41.95
Hand	MC-45DM					std	std							std	std	std	std	std	$74.95
Hand	MC-48B	*	*	*		*	*	*	*	*	*	*	*	*	*	*			$78.95
Desk	MC-60A	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*		$144.95
Desk	MC-80	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*		$99.95
Desk	MC-85	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*		$154.95
Modular Mic Switch	MJ-89															*			$67.95
External Speaker	SP-41	*	*	*	*				*	*	*	*	*	*			*	*	$44.95
	SP-50B	*	*	*	*				*	*	*	*	*	*			*	*	$47.95
Voice Synthesizer	VS-1							*	*	*									$65.95
	VS-2										*								$67.95
Noise Filter	PG-3B	*	*	*	*				*	*	*	*	*	*		*	*	*	$29.95
	TU-5							*											$52.95
	TU-7								*	*	*								$49.95
	TSU-5		*																$59.95
Tone Decoder	KQT-8			*	*							*	*						$46.95
	TSU-7													*		*	*	*	$55.95
	TSU-8						*							*		*	*	*	$55.95
DTMF Unit	DTU-2				*	*													$29.95
Memory Unit	ME-1					*													$34.95
Mobile Mount	MB-11										*	*	*			*	*	*	$33.95
	MB-14															*			$47.95
	MB-201		*	*	*									*					$22.95
	MB-430							*											$43.95
Power Cable	PG-2N	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	$13.95
Digital Recording Unit	DRU-1			*	*														$109.95
Extension Cables																			
10'	DFK-3*															*			$24.95
13'	DFK-4*															*			$54.95
22'	DFK-7*															*			$84.95

* See additional information on page 24.

Kenwood's Repair Facilities

WEST

Kenwood USA Corporation
2201 East Dominguez Street
P.O. Box 22745
Long Beach, CA 90801

Customer Relations:
(310) 639-7140
FAX: (310) 631-3913
Hours M-F: 8:30 am - 5:00 pm PT

Parts: (800) 262-1312
(310) 515-0207
Hours M-F: 8:30 am - 4:30 pm PT

Bulletin Board (Free):
(310) 761-8284

On line 24 Hours a day,
7 days a week.

Modem Settings:
No parity, 8 data bits, 1 stop bit
9600 baud or less

EAST

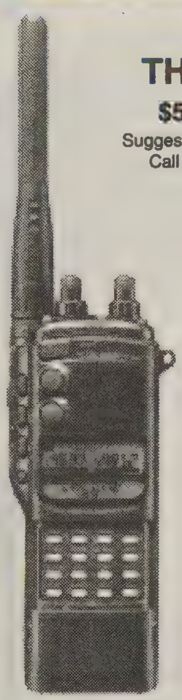
Kenwood Service Center East
829 South Lynnhaven Pkwy.
Suite 130
Virginia Beach, VA 23452

Customer Relations:
(804) 340-1702
FAX: (804) 340-6809
Hours M-F: 10:00 am - 6:00 pm ET

Parts: (800) 637-0388
(516) 483-5742
Hours M-F: 9:00 am - 6:30 pm ET

KENWOOD

Dual Band



TH-78A

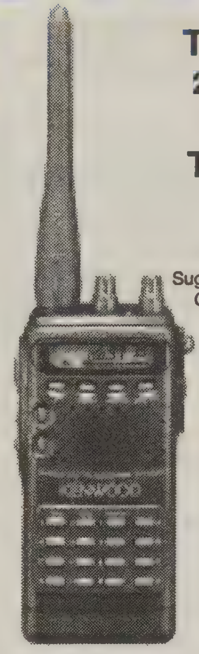
$599.95

Suggested List Price
Call for Quote

You can enjoy 2 meter and 70 cm operation with this exciting new dual-band handheld from Kenwood.

Major features include:

- Extremely compact and lightweight.
- Large, triple function LCD display includes a six character alpha-numeric readout.
- 2.5 watts on 2 meters. 2.0 watts on 70 cm with the standard PB-13 NiCd battery.
- 5.0 watts on both bands with optional PB-17 NiCd battery or with 13.8 VDC operation.
- 52 memory channels, expandable to 252 memories with the optional ME-1.
- Full-duplex cross-band operation is featured.
- 4 position power output control.
- Sliding keypad cover to prevent accidental activation.
- Auto power off, auto battery save and 10 minute time-out-timer extend operating time.
- Built-in encode / decode unit.
- 15 digit auto-dialer including *, #, A, B, C, D and built-in encode/decode.
- Uses all TH-27 / 28 accessories.



TH-22AT

2 Meters

$349.95

TH-42AT

70 cm

$389.95

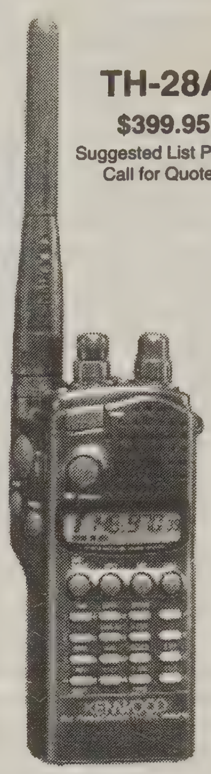
Suggested List Price
Call for Quotes

NEW!

These HT's are the latest in Kenwood's line of ultra compact hand held transceivers. These are available for either 2 meters or 440 MHz.

Major features include:

- Extended receiver frequency coverage 136 - 174 MHz on the TH-22AT.
- Five watts output with optional PB-34 battery or with 13.8 VDC power.
- Selectable 3 position output power control.
- Operates from 5.0 to 16 VDC allowing easy connection to the car battery or power supply.
- 40 memories with odd offset capability in one memory.
- Selectable memory CH number display mode.
- Multiple scanning functions.
- Tone alert system with received time indication.
- Wireless cloning function.
- Built-in CTCSS tone encoder.
- Built-in Time Out Timer and busy CH lock out.
- 'DTSS' Dual Tone Squelch System with pager function built-in.
- DTMF memory function for auto-dial operation 5, 15 digit channels.



TH-28A

$399.95

Suggested List Prices
Call for Quotes

TH-48A

$449.95

Suggested List Prices
Call for Quotes

The TH-28A covers two meters and includes a built-in UHF receiver: 118-173 MHz RX, 144-147.995 TX, 438-449.995 RX. It has 2.5 watts output with the standard PB-13 battery.

The TH-48A is the 70 cm version and it includes a built-in two meter receiver: 438-449.995 MHz TX/RX, 136-173.995 MHz RX. It has 2 watts of power using the standard PB-13 battery pack.

Features common to both radios are:

- Both handhelds are equipped with a switchable dual-band (144 MHz / 440 MHz) receive capability for semi-duplex cross-band operation.
- Alpha-numeric six character display and memory paging.
- Includes a high capacity NiCd battery pack, the PB-13, for 2.5 watts output on the TH-28A, or 2.0 watts output on the TH-48A.
- Multifunction scanning of the band or the 41 memory channels (expandable to 240 memories with optional ME-1).
- 5 watts power output available with the optional PB-14 or PB-17, or with 13.8 VDC operation.
- 15 digit auto-dialer, including *, #, A, B, C, D. Auto-dialer memory for up to 10 phone numbers.
- Built-in digital clock and encode / decode unit.
- 10 minute time-out timer to extend battery life.
- Direct keyboard frequency entry.
- CAP / MARS modifiable with proper license.
- All the TH-27 / TH-78 accessories are compatible.

Kenwood Handheld Options

Option	Model	21BT 31BT 41BT	22AT 42AT	26AT 46AT	27AT 47AT	28A 48A 78A	25AT 45AT 75AT	77A	215AT 315AT 415AT	225AT	2600A 3600A	HRO Price
Headset	HMC-2		*	*	*	*	*	*	*	*		$63.95
Speaker Mic	SMC-31		*		*	*						$59.95
	SMC-32	*	*		*	*	*	*	*	*	*	$44.95
	SMC-33		*	*	*	*						$57.95
	SMC-34		*		*	*						$59.95
Prog. Tone Decoder	KQT-8						*					$46.95
	TSU-7			*		std						$55.95
	TSU-4								*	*		$46.95
	TSU-8		*									$55.95
Antennas	RA-2										*	CALL
	RA-3								*	*	*	CALL
	RA-4										*	CALL
	RA-5								*	*	*	CALL
	RA-6	*										CALL
	RA-7	*										CALL
	RA-8A	*										CALL
	RA-9A	*										CALL
	RA-10	*										CALL
DC/DC Converter	DC-1			*			*					$26.95
	DC-26										*	$38.95
	KVC-1							*				$33.95
	PG-2W		*		*	*						$14.95
	PG-2V								*	*		$14.95
Filtered Cigarette Lighter Cord	KLF-3				*			*				$23.95
	PG-3E						*		*	*		$34.95
	PG-3H					*						$29.95
Base Quick Charge	BC-7								*	*		$114.95
	BC-15A				*	*						$99.95
	KSC-7			*			*	*				$99.95
	KSC-14		*									$84.95
	ST-2										*	CALL
Battery Case	BT-6						*	*				CALL
	BT-8				*	*						$26.95
	BT-9		*									$29.95
Softcase	SC-27									*		$19.95
	SC-28							*				$21.95
	SC-29							*				$21.95
	SC-31				*							$21.95
	SC-33					*						$19.95
	SC-34					*						$21.95
	SC-37		*									$19.95
	SC-39		*									$19.95
Wall Charger	BC-2	*										$22.95
	BC-14				*	*						$24.95
	BC-17		*									CALL

Kenwood Handheld Specifications

Model	Freq Range	Power Supply	Power Out†	Current Transmit	Current Receive	Sensitivity	Height in(cm)	Width in(cm)	Depth in(cm)	Weight oz(g)	Sugg. List
TH-22AT	144-148 MHz	6 VDC	3 W	1.3 A	45 mA	<.16 µV	4.6 (11.7	2.2 (5.6)	.96 (2.5	10.2 (290	$349.95
TH-42AT	438-450 MHz	6 VDC	2.5 W	1.6 A	45 mA	<.18 µV	4.6 (11.7	2.2 (5.6)	.96 (2.5)	9 (242)	$389.95
TH-28A	144-148 MHz	7.2 VDC	2.5 W	1.5 A	60 mA	<.18 µV	4.6 (11.5	1.9 (4.9)	1.5 (3.8)	12 (330)	$399.95
TH-48A	438-450 MHz	7.2 VDC	1.5 W	1.5 A	70 mA	<.18 µV	4.6 (11.5	1.9 (4.9)	1.5 (3.8)	12 (330)	$449.95
TH-78A	2m & 440MHz	7.2 VDC	1.5 W	1.4 A	60 mA	<.18 µV	5.3 (13.4	1.9 (4.9)	1.6 (4.1)	15 (400)	$599.95

† Higher power output with optional batteries

STANDARD®

The largest manufacturer of VHF/UHF Amateur Radio equipment in the world.

Small HTs

C158A
2 Meters in Your Pocket

$339.95

Suggested List Prices
Call for Quotes

- 130-170 MHz transmit.
- 144-148 MHz receive.
- Power output with standard battery 2.0W.
- 5 Watts at 12 Volts.
- CTCSS encode/decode standard.

NEW!

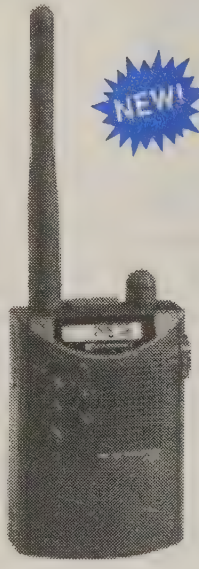
C108A
2 Meter Handheld

$269.95

Suggested List Prices
Call for Quotes

- 144-147.995 MHz transmit.
- 100-174.995 MHz receive.
- Power output with standard battery 0.2W.
- Small and compact.
- CTCSS encode built-in.

NEW!



C168A
2 Meter — $489.95

C468A
440 MHz — $499.95

Suggested List Prices
Call for Quotes

C168A
- 144-147.995 MHz transmit.
- 115-175 MHz receive.
- Receives (AM) Aircraft Band.
- Power output with standard battery 2.8W.

C468A
- 438-449.995 MHz transmit.
- 400-470 MHz receive.
- Power output with standard battery 2.5W.
- 5 Watts at 12 Volts.
- External DC jack for 12V input.

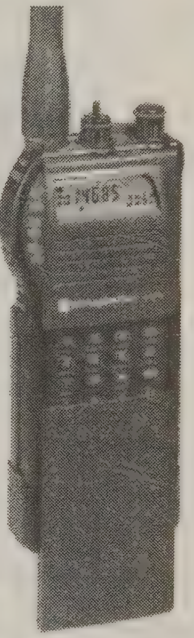
Ultra-Thin

C288A
220 MHz Thin Handheld

$529.95

Suggested List Price—Call for Quote

- 2.8W with standard battery, 5W at 9.6VDC.
- Ten 15-digit autodial memories.
- Advanced H.E.C. technology.
- Slide cover protects keyboard.



Dual Band

C178A
2 Meters *and* 440 MHz

$459.95

Suggested List Price—Call for Quote

- 438-449.995 MHz transmit.
- 110-174.995 & 320-474,995 MHz receive.
- Power output with standard battery: 2.0W (2m).
- 5 Watts at 12VDC (2m).
- 50 mW output on 70 cm.
- AM programmable receive for aircraft.
- Ten 15-digit DTMF memories.
- DTMF Paging/Coded Squelch.

NEW!

Call a helpful Ham at HRO for quotes and more info about Standard radios.

Standard Handheld Specifications

Model	Frequency	Power Supply	Power Out Transmit@	Current Transmit	Drain Receive	Sensitivity	Height in	Width in	Depth in	Weight oz
C108A	100-174.995 MHz †	3.0 VDC	.2W	.22 A		.112 µV 12 dB	3.15	2.28	0.98	4.9
C158A	130-1669.995†	7.2 VDC	2.0 W	700 mAh	40 mA	.158 µV 12 dB	5.38	2.2	1.2	12.5
C168A	115-175 MHz †	7.2 VDC	2.8 W	700 mAh	38 ma	.158 µV 12 dB	4.9	1.8	1.2	10
C178A	110-174, 320-474.995†*	7.2 VDC	2.0 W	700 mAh	38 ma	.158 µV 12 dB	4.88	2.2	1.2	
C288A	220-224.995 MHz	7.2 VDC	2.8 W	700 mAh	38 ma	.158 µV 12 dB	5.8	2.3	1	10
C468A	438-449.995 MHz	7.2 VDC	2.5	700 mAh	38 ma	.158 µV 12 dB	4.9	1.8	1.2	10

† Transmit amateur bands only. Frequencies are for receive only *Am receive for aircraft @Higher power with optional batteries

Twin-Band FM Handhelds

"Everyone loved it" *...QST – June 1991*

QST even used the C228A as a reference to compare to other manufacturer's dual-banders!

C528A

Deluxe H/T with

2 Meters AND 440 MHz

$699.95

Suggested List Price—Call for Quote

- 144-147.995 & 438-449.995 MHz
- 130-170 & 400-470 MHz receive
- Power output w/standard battery 2.8W/2 meters, 2.5W/440 MHz
- Advanced design flex antenna

C228A

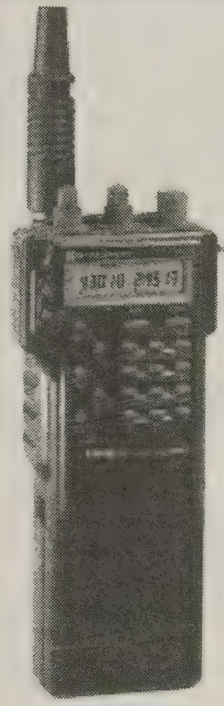
World's only H/T with

2 Meters AND 220 MHz

$719.95

Suggested List Price—Call for Quote

- 144-147.995 & 220-224.995 MHz
- 130-174 & 220-245 MHz receive
- Power output w/standard battery 2.8W/2 meters, 2.5W/220 MHz
- Autodial: up to 15 digits



C628A

Deluxe H/T with

440 MHz AND 1.2 GHz

$727.95

Suggested List Price—Call for Quote

- 438-449.995 & 1240-1300 MHz
- 400-470 & 1240-1300 MHz receive
- Power output w/standard battery 2.5W/440 MHz, 1W/1.2 GHz
- Autodial: up to 15 digits

C558A

Deluxe Super-CompactH/T

2 Meters AND 440 MHz

$689.95

Suggested List Price—Call for Quote

- 144-147.995 & 438-449.995 MHz
- 115-170 & 440-470 MHz receive
- Receives (AM) Aircraft Band
- 2.8W/2m, 2.5W/440MHz with standard battery
- Ten 15-digit autodial memories

C228A / C528A / C628A / C558A

•Memory channels:	40 (20 +20 "limited") +2 call +2 vfo (non-removable memory unit).	40 (opt. 40- or 200-mem. units plug in).
•Sensitivity (ham bands):	0.158 µV for 12dB SINAD.	0.158 µV for 12dB SINAD.
•NiCd battery pack:	700 mAh, 7.2VDC standard! Other sizes optional.	700 mAh, 7.2VDC std. (fits 228/528/628).
•Power output (12VDC):	5 W high, 2.5W mid, 350mW low (1.2GHz: 1W high).	5 W high, 2.5W mid, 350mW low.
•External input voltage range:	6.0 to 16 volts DC.	6.0 to 16 V. DC w/included CMA181.
•Battery Save mode:	Also automatic power-off mode.	Also automatic power-off mode.
•Subaudible tone deck:	CTCSS encode and decode standard.	CTCSS encode/decode standard.
•Paging function:	Also DTMF coded squelch.	Also DTMF squelch, even w/CTCSS.
•Cross-band operation (full-duplex):	Push-button control of cross-band repeat mode.	P.B. control of Cross-band repeat.
•Twin-Band (not just dual-band):	Receives on 1 band while transmitting on the other.	RX 1 band while TX on other band.
•Scan function:	5 scan modes per band, each band is independent.	5 scan modes; 3 types on each band.
•Low current drain (Twin-band):	70mA squelched receive, 32mA battery save.	70mA squelched RX, 25mA batt.save.
•Even less current drain in single band mode:	36-45mA squelched, 17-18mA batt save.	36-45mA sq., 17-18mA batt.save.
•Cloning (duplicate program) over the air:	Simply transmit to another C228/528/628A.	Simply transmit to another C558A.
•Size (approximate, w/battery, w/o protrusions):	6.2"H x 2.2"W x 1.2"D.	5.1"H x 2.2"W x 1.2"D.
•Weight (approximate):	17 oz with battery and antenna.	12.5 oz with battery and antenna.
•MARS and CAP (copy of license required):	Info available from Ham Radio Outlet.	Info available from HRO.

STANDARD®

Presenting the most advanced, highest quality radios available today!

C5718DA

$849.95

Suggested List Price—
Call for Quote

What Twin-Band Mobile's Speaker-Mike Displays Both Bands?

What Twin-Band Mobile Delivers up to 50 Watts?

The Standard C5718DA, of course!

This is the smallest, lowest price twin-band mobile radio that delivers all these features.

Operate the C5718DA from its optional snap-on front panel with twin frequency display (CRC5700) or mount it under a seat or even in the trunk using the optional cable (CAW571 or CAW572).

The C5718DA is designed with packet in mind with out-of-the-box high-speed, 9600 baud and interface for both VHF and UHF bands. Just connect your TNC to the C5718DA and you are on the high speed packet network. Also operates at 1200 and 2400 baud equally well.

Features include:

- Unsurpassed intermod rejection.
- Built-in antenna duplexer.
- Dual frequency receive. 2 VHF, 2 UHF or VHF / UHF.
- Extended receiver frequency range. 110-199.995 MHz including AM aircraft and 250-499.995 MHz.
- Eight scanning options.
- 40 memories (20 per band) stores frequency, offsets and tones.
- 200 memory channels with optional CMU182.
- CTCSS encode/decode standard.
- Full duplex cross-band operation with CTCSS tones.
- Paging and coded squelch.
- DTMF autopatch dialing.

Standard Pioneers Another First! The C5718DA is Packet Ready.

C1208A

$529.95

Suggested List Price
Call for Quote

A full featured 2-meter rig that fits anywhere, yet puts out a full 50 watts as well — that's Standards new C1208DA. With all controls and the large liquid crystal display in the speaker / microphone, this rig can mount anywhere. It can be mounted under the seat, behind the dash, or in the trunk (with optional extension cable). All this plus it's packet ready (up to 9600 baud) and includes wide range (100-200 and 250-520 MHz) receive including AM aircraft.

Other features include:

- Frequency range: TX 144-148; RX 100-199.995 plus 250-519.995 MHz, FM or AM.
- Power output is 50, 10 or 3 watts selectable.
- 100 memories stores frequency, offsets and CTCSS tones.
- CTCSS encode and decode built-in.
- DTMF auto dialing, 10 memories of 15 digits each.
- 6 modes of scanning including priority and CTCSS.
- Built-in quiet cooling fan.
- Mobile mounting bracket and 9-foot power cord included.

Standard Handheld Accessories

Model	Description	C108A	C168A C468A	C158A	C188A C288A C488A	C228A C528A C628A	C178A	C558A	HRO Price
	Microphones/Speakers								
CHP111	Headset/Boom Mic (PTT)	*	*	*	*	*	*	*	$45.95
CHP150	Headset/Boom Mic (VOX AND PTT)	*	*	*	*	*	*	*	$81.00
CMP111	Speaker Microphone	*	*	*	*	*	*	*	$54.95
CMP113	Clip-on Submini Microphone with Earphone	*	*	*	*	*	*	*	$44.00
CMP115	Mini Speaker Microphone	*	*	*	*	*	*	*	$50.00
	Memory								
CMU160	Extra 40-Memory Plug-In Unit (Swap in-and-out)		*					*	$31.00
CMU161	200-Memory Plug-In Unit (Swap in-and-out)		*				*	*	$44.00
CMU181	Extra 40-Memory Plug-In Unit (Swap in-and-out)		*						$36.00
CMU182	200-Memory Plug-In Unit (Swap in-and-out)				*				$44.00
	Batteries, etc								
CNB150	Opt. Small NiCd, 7.2VDC, 400mAh					*		*	TBA
CNB151	Standard NiCd Batt, 7.2VDC, 700mAh			*		*			$78.95
CNB151GY	Standard NiCd Batt, 7.2VDC, 700mAh							*	$99.95
CNB152	Opt. High-Power NiCd Batt. 12VDC, 600mAh			*		*		*	$99.95
CNB153	Opt. Long-Life NiCd Batt, 7.2VDC, 1000mAh			*		*		*	$99.95
CNB160	Opt. Small NiCd, 6VDC, 300mAh		*						$72.95
CNB161	Standard NiCd Batt, 7.2VDC, 700mAh		*						$75.95
CNB162	Opt. High-Power NiCd Batt. 12VDC, 600mAh		*						$119.95
CNB163	Opt. Long-Life NiCd Batt, 7.2VDC, 1000mAh		*						$99.95
CNB171	Standard NiCd Batt, 7.2VDC, 700mAh						*		TBA
CNC172	Opt 12V 600 mAh NiCd Batt						*		TBA
CNB173	NiCd Battery 7.2V 1100 mAh						*		TBA
CNB181	Opt. Small NiCd, 4.8VDC, 700mAh				*				$57.95
CNB182	Opt. High-Power NiCd Batt. 9.6VDC, 600mAh				*				$99.95
CNB183	Opt. Long-Life NiCd Batt, 6.0VDC, 1100mAh				*				$95.95
CNB184	Standard NiCd Batt, 6.0VDC, 700mAh				*				$67.95
CNB401	NiCd Battery Pack	*							TBA
CBT151	Alkaline Case, for 6 AA batteries					*			$20.95
CBT151GY	Alkaline Case. for 6 AA batteries							*	$20.95
CBT160	Alkaline Case, for 5 AA batteries		*						$20.95
CBT171	Battery Case (6 cells)						*		TBA
CBT175	Battery Case (2 cells)						*		TBA
CBT181	Alkaline Case, for 4 AA batteries				*				$17.95
CBT182	Alkaline Case, for 5 AA batteries				*				$27.95
CAX160	Battery Separation Cable (Remote Battery Adapter)		*						$50.95
	Chargers, etc								
CAW150	Mobile 12 V Power Cable w/Lighter Plug		*	*		*	*	*	$16.95
CAW151	12V Power Cable		*	*		*	*	*	$13.95
CAW152	Mobile Cable, Lighter plug & Noise Filter						*		
CCA160	Chg.Adapt.,CBT160(NiCd's)to Wall Chgr. or CMC150		*						$26.95
CMA181	Mobile 12 V Power Cable w/Lighter Plug (w/Adapter)				*				$38.95
CMC150	Mobile Charger (not for 12VDC NiCd's or 9.6VDC NiCd's)		*	*	*	*	*	*	$27.95
CSA181A	Peak-Detecting Auto-Rapid Desktop Charger		*	*	*	*	*	*	$109.95
CSA401A	NiCd Battery Charger	*							TBA
	Cases, etc								
CAX02	Bottom Cover (pair)			*		*			$11.95
CAX03	Bottom Cover		*				*		$11.95
CBH160	Spring-Loaded Clip		*			*		*	TBA
CLC151	Std case for CBT151 and CNB151			*					$24.95
CLC152	Large Case for CNB152 and CNB153			*					$26.95
CLC160	Small Soft Case (use with CNB160)		*						$26.95
CLC161	Med. Case (w/CNB161 or CBT160)		*						$26.95
CLC162	Large Soft Case (use with CNB162/163)		*						$27.95
CLC171	Std case for CBT171 and CNB171						*		TBA
CLC172	Large case for CNB172 and CNB173						*		TBA
CLC181	Small Soft Case (use with 181 or CBT-181)				*				$18.95
CLC182	Med. Case (w/CNB182/83/84 or CBT182)				*				$20.95
CLC401	Standard Soft Case	*							TBA
CLC402	Deluxe Soft Case	*							TBA
CLC520	Med. Case (w/CNB151 or CBT151)					*			$27.95
CLC521	Large Soft Case (use with CNB152/153)					*			$27.95
CLC550	Med. Case (w/CNB151 or CBT151)							*	$27.95
CLC551	Large Soft Case (use with CNB152/153)							*	$30.95
CLC555GN	Pouch (Green)						*	*	$34.95
CLC555OR	Pouch (Orange)						*	*	$34.95
CMB111	Mobile Bracket		*		*	*		*	$21.95
CMB112	Mobile Bracket						*	*	$21.95

Standard Mobile Accessories

Model	Radio	Description	HRO Price
CAW562	C5608DA	13 ft. extinsion cable remotes radio to trunk (mike w/LCD display allows full control)	$45.95
CAW560	C5608DA/C1208DA	Dual microphone cable for second microphone (allows an additional operating position)	$44.95
CAW561	C1208DA	6 ft. mic extension cable	TBA
CSK12	C5608DA/C1208DA	External extension speaker (necessary if trunk mounting the radio)	$47.95
CRC5700	C5718DA	Removable front panel with twin frequency display	$199.95
CAW570	C5718DA	Split cable for microphone	$62.95
CAW571	C5718DA	2 meter microphone extension cable	$43.95
CAW572	C5718DA/C1208DA	4 meter microphone extension cable	$48.95
CAW573	C5718DA	2 meter extension cable for the front panel (CRC5700)	$27.95
CAW574	C5718DA	4 meter extension cable for the front panel (CRC5700)	$36.95
CAW575	C1208DA	Extra 12 volt power cable 15 ft	TBA
CAW576	C1208DA	Extra 12 volt power cable 9 ft	TBA
CMU182	C5718DA	200 memory option module	$44.95

YAESU

FT-1000D

$4919.95

Suggested List Price
Call for Quotes

The FT-1000D was designed with optimum performance and user convenience in mind! It incorporates the latest digital and RF technologies to meet today's demanding needs on the HF bands. It employs extensive surface-mount components, 6 microprocessors, and five Direct Digital Synthesizers all integrated into a reliable full-featured transceiver optimized for the serious amateur.

The FT-1000D includes these items as standard features: BPF-1 module for cross-band dual receive; TCXO-1 High Stability Oscillator; XF-C 2.4 kHz SSB filter; XF-D 2.0 kHz SSB Filter; and XF-E 500 Hz CW filter. Options are the XF-F 250 Hz CW filter; XF-455MC 600 Hz sub-receiver CW filter; and the DVS-2 Digital Voice Recording Module.

FT-1000

$3889.95

Suggested List Price
Call for Quotes

For the budget minded ham that wants the top-of-the-line radio, Yaesu offers the FT-1000. It has all the features of the FT-1000D except the BPF-1, TCXO-1, XF-C, XF-D, XF-E listed for the FT-1000D. These may be added later. Additional options are the XF-F 250 Hz CW filter; XF-455MC 600 HZ CW filter and the DVS-2 Digital Voice Recording Module.

Selected features include:

- General coverage receiver from 100 kHz to 30 MHz.
- All mode operation (SSB, CW, FSK, AM, FM, Packet). Optimized for digital communications modes.
- Built-in power supply for 110, 117, 220 & 234 VAC 50/60 Hz.
- Transmitter output is 200 watts. (50 watts AM)
- Receiver is quad-conversion with a 108 dB dynamic range.
- Flexible Mode and IF Filter Selection.
- Special features for CW operation including CW spot, audio peak filter and variable IF bandwidth.
- Band pass filter BPF-1 module built-in on FT-1000D.
- Optional digital voice recording with the DVS-2 module.
- Simultaneous dual frequency reception. Each VFO has its own flywheel-weighted tuning knob.
- 99 memories storing frequency, mode, filter selection.
- CAT system allowing the radio to be computer controlled.
- Now compatible with K1EA CT program.

Yaesu HF Specifications

		Power Supply		Current Drain		Power Output									
Model	Frequency Range	AC	DC	Xmit	Rec	AM	FM	SSB	CW	Mike Z	Receive Circuitry	Sensitivity 1.8-30 MHz †	RIT/XIT Range	Audio Output	Sugg. List
FT-1000D	100 kHz - 30 MHz	117/234		1050 VA	95 VA	50 W	200 W	200 W	200 W	500-600 Ω	Quad Conversion	< .25 µV	±9.975 kHz	2 W	$4,919.95
FT-990	100 kHz - 30 MHz	117/234	#	470 VA	60 VA	25 W	100 W	100 W	100 W	500-600 Ω	Triple Conversion	< .25 µV	±9.975 kHz	2 W	$2,579.95
FT-890	100 kHz - 30 MHz		13.8 VDC	20 A	1.5 A	25 W	100 W	100 W	100 W	500-600 Ω	Double Conversion	< .25 µV	±9.99 kHz	1.5 W	$1,439.95
FT-840	100 kHz - 30 MHz		13.8 VDC	20 A	1.2 A	25 W	100 W	100 W	100 W	500-600 Ω	Double Conversion	< .25 µV	±1.25 kHz	4 W	$999.95
FT-650	24.5 - 56 MHz	120/230	13.8 VDC	500 VA	55 VA	25 W	100 W	100 W	100 W	500-600 Ω	Triple Conversion	< .125 µV	±9.975 kHz	1.5 W	$1,859.95
FT-767GX	100 kHz - 30 MHz	120/230		650 VA	55 VA	25 W	100 W	100 W	100 W	500-600 Ω	Triple Conversion	< .25 µV	Unlimited	1.5 W	$2,299.95

# The FT-990DC version operates on 13.8 VDC only. † Sensitivity measurements for 1.8-30 MHz SSB,CW

HF TRANSCEIVERS

FT-990

$2579.95
Suggested List
Price—
Call for Quotes

Based on the remarkable performance and easy operation of the FT-1000, Yaesu's new FT-990 combines the basic technical features of that top-of-the-line model with several recent advances, such as a very quiet switching mode AC power supply and digital switched capacitance filters (SCF), resulting in a spectacular performer at a very reasonable price.

Like the FT-1000, but without dual receive, the FT-990 utilizes multiple direct digital synthesizers (DDS) and a magnetic rotary encoder for silent, silky-smooth tuning, pure local signals and very fast t/r changeover important in QSK CW and digital modes. The extremely quiet receiver circuitry of the FT-1000, using a quad-FET first mixer, has been duplicated in the FT-990 to provide clear reception of even the weakest signals. Also like its big brother, all local signals are derived from a single master oscillator, and an optional temperature compensated oscillator is available to provide exceptional +0.5-ppm stability from -10 to +50° C. Interference rejection is facilitated by both IF shift and an IF notch filter, with push-button selection of IF bandwidths, and an astounding dual digital SCF audio filter with independently adjustable selectivity skirts (unique to the FT-990). An automatically mode dependent AGC selection is provided along with manual AGC decay selection / disable.

The front panel keypad provides 1-touch band selection, with two independent (A/B) VFOs for each band holding their own frequencies, modes and IF bandwidth settings, and even clarifier offsets and repeater shifts, if used. Switching bands instantly recalls all the settings last used on each band. Ninety freely tunable and scannable memories are selectable with single (MEM) knob, each storing all of the operating data held in both VFOs. Other important features include general coverage reception from 100 KHz to 30 MHz, a jack and front panel button for a separate receive-only antenna, an effective noise blanker, all-mode squelch, independent receive and transmit clarifiers, 6-function multimeter and an RF speech processor for SSB.

Special features for CW operation include a built-in iambic memory keyer with dot-dash memory, presettable BFO offset and spotting button for precise tuning by zero-beat, and key jacks on both front and rear panels. In addition to the remarkable facility of the SCF audio filter for CW reception, a 250-Hz IF filter is available as an option to complement the supplied 500Hz bandwidth IF filter.

For serious voice contesting, the same DVS-2 digital voice recorder option introduced with the FT-1000 can also be used with the FT-990, providing continuous-loop receiver recording and pushbutton transmission of multiple voice messages to help keep you at your peak QSO-rate throughout the contest.

With its efficient internal AC switching regulator supply, the FT-990 weighs only 13 kg and runs cool all the time. An internal heatsink and whisper-quiet, temperature switched squirrel cage blower allow up to 100 watts (25 watts AM) transmitter output without any rear panel protrusions, giving easy access to rear panel connectors. The FT-990 incorporates the same high-speed antenna tuner as the FT-1000, with its own microprocessor and 39 memories which automatically store most recent antenna matching settings for nearly instant recall while changing operating frequency.

A 13.8 VDC version of the FT-990 is also available. The FT-990DC, has the same features as the FT-990 except it does not have the built-in power supply or a built-in CW filter.

FT-890

$1439.95

FT-890 / AT

$1649.95

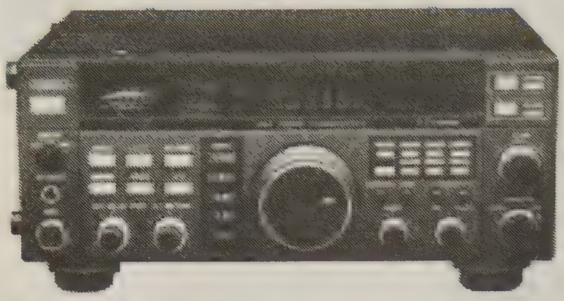
Suggested List Prices—Call for Quotes

This high performance, compact transceiver is a Field Day and contest winner. This rugged mobile transceiver performs like the FT-1000 and is the smallest HF rig with a built-in antenna tuner. It provides up to 100 watts transmitter output on all HF bands in SBB, CW and FM modes, as well as up to 25 watts carrier in the AM mode. The receiver tunes all frequencies between 100 KHz and 30 MHz in 10 Hz steps.

Major features include:

- Frequency coverage: RX 100 kHz-30 MHz, TX: 160-10m Amateur Band
- Optional internal automatic antenna tuner for 160-10 meter operation.
- Pass Band Shift
- Noise blanker with adjustable pulse width
- Full break-in CW.
- Selectable AGC.
- Two DDS synthesizers.
- DFCS (Duct Flow Colling System) for 100% duty cycle transmitter.
- Dual VFOs and 32 memories.
- IF notch and IF shift.
- All mode squelch.
- FM repeater operation
- Weighs only 12 pounds.
- Accessory items include: YF-101 wide SSB filter; YF-100 500 Hz CW filter; XF-455K-251-01 250 Hz CW filter; DVS-2 digital voice recorder.

**Call toll free
for HRO's
discount prices
on Yaesu equipment.**



FT-650

1859.95

Suggested List Price—Call for Quotes

The FT-650 is a high performance all mode transceiver providing transmission on the 24.5, 28 and 50 MHz amateur bands and continuous general coverage reception (where legal) from 24.5 to 56 MHz. Transmitter power output is adjustable from 10 to 100 watts in CW, SSB and FM modes and up to 25 watts carrier in AM mode.

The FT-650 operates fromn 13.8 VDC or with the FP-22 switching power supply which is mounted on the rear and included.

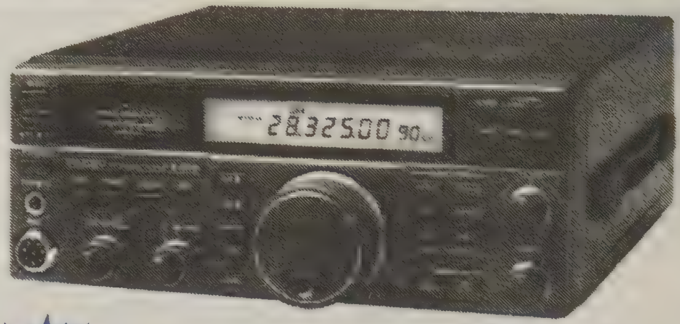
FT-650 design incorporates a compartmentalized steel chassis with extensive use of surface mount components on individually shielded plug-in composite epoxy boards. The diecast final amplifier module and the slide-in 100% duty cycle FP-22 power supply option each have their own independent forced air cooling systems.

For exceptionally clean receiver and transmitter performance, the FT-650 incorporates three Direct Digital Synthesizers (DDS) for its local oscillators (all driven by a single ± 2 ppm TCXO master oscillator) and a 2 stage low-noise (1.2 dB NF) front end RF amplifier with the first stage switchable from the front panel,

Two microprocessors in the FT-650 allow a simple user interface with a minimum of knobs and buttons. In addition to standard IF bandwidths, fine tailoring of the IF passband is made possible by two DSSs which provide selectable IF bandwidths of 1.8, 2, 2.2 and 2.4 kHz in SSB modes; 300, 600, 1200 and 2400 Hz in CW mode; 2.4 and 6 kHz in AM; and 15 kHz in FM mode. (300 and 600 Hz in the CW mode require the optional CW filter.)

There are 105 scannable memories, each of which stores its own mode and IF filter selection. Memories also store one frequency on each band, scan status and CTCSS tone frequency (with the optional FTS-8 tone squelch unit).

Optional accessories include the DVS-2, Digital Voice Recording System; MD-1B8 desk top microphone, SP-5 external speaker with AF filter, XF-455M6 600 Hz CW filter and FTS-8 CTCSS encoder/decoder.



NEW!

FT-840

$999.95

Suggested List Price—Call for Quotes

If you are trading up from an older rig and are on a tight a budget, you want the most you can afford in a top-notch HF transceiver. Then the FT-840 is for you. It is right on the money! Consider a mobile HF or field radio and doubt the quality and features of tiny HF rigs? Then the FT-840 is for you. It will not disappoint you!

Built to handle rigorous field operation, the new intense LCD display affords sharp visibility in bright sunlight. Die-cast heat sink and internal thermally switched fan keep the FT-840 running cool. Modular design circuit boards ensure operating efficiency with manufacturing excellence you would expect in much higher priced radios.

For high performance, the FT-840 features a low noise front end that uses the latest in FET RF amplifier design. It has two DDSs and magnetic encoder for silent, smooth tuning and fast switching. Twin band-stacking VFOs and automatic 10m FM repeater offset with selectable CTCSS provide the best for 10m repeater operation.

Blending the high performance digital frequency synthesis techniques from the FT-840 with the operating convenience and affordability of its predecessor, the FT-747GX, the FT-840 adds a choice of two optional remote automatic antenna tuners and a wealth of convenient functions. The FT-840 sets the standard for high performance, affordable, HF transceivers. As a first time rig, back-up, mobile or main station transceiver, the FT-840 has the features and dependability that both beginners and seasoned operators will appreciate.

The FT-840 is of Top-of-the-Line quality with a wealth of features—all at an affordable price. This is just what you would expect from Yaesu. For high-tech performance and a wealth of features that will not break you budget, stop in to an HRO store and see a demonstration. Just call an HRO Toll Free number for the latest price.

Features include:

- General coverage receiver from 100 kHz to 30 MHz. TX frequency 160-10m amateur bands.
- Direct Digital Synthesis (DDS).
- IF Shift.
- 100 memory channels (independent TX/RX per memory).
- Twin Band Stacking VFO's.
- FM Repeater Operation with automatic 10 meter repeater offset w/selectable CTCSS encode.
- CW reverse feature.
- Choice of two optional antenna tuners: FC-10 Matching External Tuner or FC-800 External Remote Tuner.

HF Amplifier

FL-7000

$2459.95

Suggested List—Call for Quotes

Designed to match the Yaesu HF radios, the FL-7000 is a CPU controlled, full break-in, all solid state linear amplifier with built-in power supply and automatic antenna tuner. Power is up to 1.2 kW input on the amateur bands.

When changing bands or retuning the radios, the amplifier automatically retunes itself to match the SWR of the antenna. Tuner settings for each band are stored in lithium-backed RAM for instant recall without the need to transmit.

Up to four different antennas can be connected and automatically selected when the optional FAS-1-4R remote antenna relay is used. The amp covers 160 -15 m and may be modified by the amateur for 10 m operation.

Meters

YS-60

$124.95

HRO Price

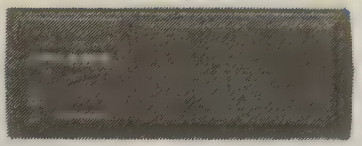
YS-500

$99.95

HRO Price

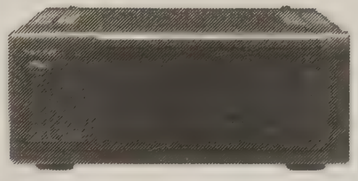
Yaesu's in-line SWR / power meters monitor both average and peak transmitter power and voltage standing wave ratio (VSWR) of antenna systems in two way radio stations from 1.6 to 60 MHz (YS-60) or 140 to 525 MHz (YS-500). These compact meters can be located almost anywhere in the station. YS-60 requires 12 VDC for PEP operation.

Power Supplies



FP-757HD

The FP-757HD is a continuous duty power supply with FT-757GX styling but will go nicely with the FT-747GX or FT-890. To permit long periods of operation there is a built-in cooling fan. For improved operation, a front facing speaker is built-in.
Suggested List $334.95



FP-800

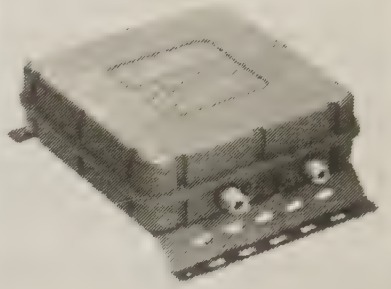
The FP-800 is the matching AC power supply for the FT-890. It can also be used with the FT-990DC. It features a large, front mounted built-in speaker and internal cooling fan. The FP-800 is rated at 20 amps at 13.8 VDC. It operates on 117 or 220 volts AC input.
Suggested List $309.95

Antenna Tuners

FC-757AT

The FC-757AT automatic antenna tuner includes its own microprocessor and lithium-backed memory to allow push button storage in RAM of optimum tuner settings on a particular antenna and band. The tuner includes a built-in 50 ohm dummy load and a dual range watt meter.

With the optional FAS-1-4R remote antenna selector, up to four antennas can be controlled with the use of only one feed line. **Suggested List $530.95**



FC-800

The FC-800 is an external remote mount, automatic antenna tuner especially designed for the FT-890 transceiver. The tuner is fully automatic and operations can be controlled from the front panel of the FT-890 for easy operations. The FC-800 has 30 memory locations for quick tuning.
Suggested List $499.95

Broadband HF Antenna

YA-30

$239.95

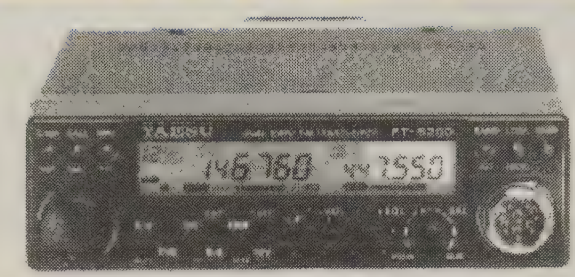
HRO Price

Specifications	
Frequency Range	1.8-30 MHz (continuous coverage)
Power Rating	150 watts P.E.P
Input Impedance	50 ohms
Commercial SWR	less than 2:1 fro 1.8 - 30 MHz
Amateur SWR	less than 1.9:1 160 - 10m amateur bands
Antenna Length	83 feet
Coaxial Feedline	100 feet of RG-8X with PL-259

The YA-30 broadband dipole antenna is designed to provide optimum performance over a wide frequency range. The usual requirements for multiple antennas or an antenna tuner between the rig and antenna are eliminated by the unique broadband design. Preassembled and pretuned, the YA-30 antenna can be installed in three different ways (horizontal flattop, inverted-V, or sloper). Specifications are shown in the chart above.

YAESU

Dual Band Mobiles



FT-5200
2 meter & 70 cm
$789.95

FT-6200
70 cm & 23 cm
$879.95

Suggested List Prices—Call for Quotes

The **FT-5200** (for the 2-m & 70-cm bands) and **FT-6200** (for the 70-cm & 23-cm bands) are the latest innovations from the originators of mobile crossband full duplex and detachable front panel design in amateur transceivers. New miniaturization technology allows improvements such as a built-in antenna duplexer, dual full-frequency liquid crystal display (with signal strength / power output bargraphs for each band), 8-level automatic display / button lighting dimmer, and dual external speaker jacks (one for each band).

An efficient thermally-switched cooling fan allows up to 50 watts on the 2-meter band (FT5200), 35 watts on the 70-cm band, and 10-watts on the 23-cm band (FT-6200).

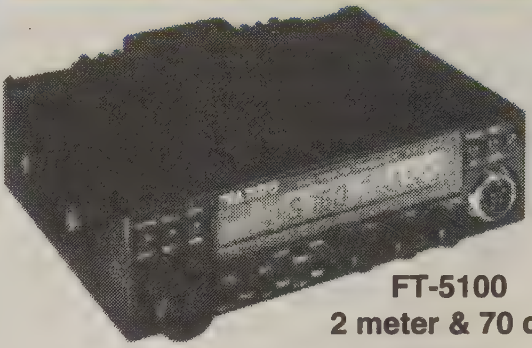
Thirty-two freely tunable memories (sixteen per band) offer complete programmability and scanning features, such as independent transmit and receive frequencies, programmable repeater offsets and scan limits, selectable scan resume modes and memory skip, priority monitoring and 1-touch instant recall CALL channels for each band. Channel steps are user-selectable, and Automatic Repeater Shift can be activated to automatically set standard repeater shifts when tuning to repeater subbands.

When the front panel is connected through an optional cable the transceiver can be installed separately from the panel. As another option for remote control, the MW-1 Wireless Microphone / Controller option duplicates the controls (including volume and squelch), adding a DTMF (Dual-Tone, Multi-Frequency) keypad and microphone.

With the FRC-4 Paging / Selcall option you can select a 3-digit ID code and your receiver stays quiet until your code is received (from any DTMF equipped transceiver). You can choose whether to have a code open the squelch or a ring like a telephone. PAGE mode displays the caller's code so you know who is calling. Seven 3-digit code memories on each band store your ID plus that of the calling station and those of five other stations or groups for calling and monitoring. The DVS-3 Digital Voice / DTMF Pager option includes all of the Paging / Selcall features of the FRC-4, and it also records both received signals and messages for transmission.

A built-in 38-tone programmable CTCSS (Continuous Tone-Coded Squelch System) encoder is standard in both models, and CTCSS tone squelch operation on both bands is available with the FTS-22 Dual Band CTCSS Decoder option, which also provides a telephone type CTCSS Bell alerting function. Radio includes a back-lit DTMF microphone.

Dual Band Mobile



FT-5100
2 meter & 70 cm
$749.95

Suggested List Price—Call for Quotes

On this "Ultimate Definition of Dual Band" radio you can listen to two 2 meter frequencies or two UHF frequencies at the same time with the In-Band Dual Receive. The FT-5100 has an expanded 2 meter receive range (130-174 MHz) and transmits on 144-148 MHz. The 70 cm band covers 430-450 MHz on transmit and receive. The radio has 94 memories (47 per band) that will store odd splits. It has built-in CTCSS encode, antenna duplexer, full-duplex cross-band operation, packet radio TNC jack and cross-band repeater function. Output is 50 watts on 2 meters and 35 watts on 70 cm. Best of all, the FT-5100 is "affordable".

Portable All-Mode

FT-290R
2 meter
$699.95

FT-690R
6 meter
$839.95

FT-790R
70 cm
$819.95

The Mark II series of all-mode radios operates on 12 volts from your vehicle or, with the optional C-cell battery pack and shoulder strap, use the radio while on foot. Includes SSB, CW, and FM; 10 memories, LCD display, memory of repeater shift and offset tuning for satellite operation. Great for camping trips.

Suggested List Prices
Call for Quotes

VHF / UHF Mobiles

FT-2500M—2 meter

$TBA

FT-7400H—70 cm

$569.95

Suggested List Prices
Call for Quotes

The New FT-2500M keeps all the great features of the popular FT-2400H and goes one better. The easy-to-operate front panel design has rubber coated knobs and a large amber display. The Yaesu exclusive 3-stage advance track tuning feature reduces intermodulation and front-end overload.

These are powerful, rugged mobiles, built as close to commercial grade performance as you can get in amateur frequencies. A one-piece die-cast chassis and extra large heat sink add to the toughness. Yaesu brings you the only mobiles with military spec rating.

Convenient features abound: The most often used controls are on the front and those you set and forget are neatly hidden behind a flip up panel. The DTFM microphone is backlit. The CTCSS encode is built-in. Both models come with automatic power off and time-out timer. There are 31 memory channels.

The FT-2500M receives 140-174 MHz and transmits on 144-148 MHz. Power output is 50 / 25 / 5 Watts. The backlighting adjustment is either manual or automatic.

The FT-7400H receives and transmits on 430-350 MHz. Power output is 35 / 20 / 5 Watts.

Accessories available include: FTS-17A, CTCSS decode unit; FRG-6, DTMF paging unit; SP-4, external speaker; and FP-700, power supply.

FT-2400H—2 Meter

$439.95

Suggested List Price—Call for Quotes

The FT-2400H takes full advantage of military-grade mechanical and electronic construction techniques to bring you a rugged, reliable rig with up to 50 watts power output.

Some features: Backlit LCD display, knobs, and major buttons are automatically controlled by a photosensor. Less-often-needed front panel buttons have a flip-down protective cover. Thirty-one memory channels. Tuning steps are user-selectable from 5 to 50 kHz. 38-tone programmable CTCSS encoder is built-in as standard; decode unit is available as an option. Back-lit DTMF microphone is included.

FT-2200—2 meters

$459.95

FT-7200—70 cm

TBA

Suggested List Prices
Call for Quotes

These full featured mobiles from Yaesu have 50 memories, AM "Aircraft" receive and selectable channel only display. The optional MW-2 wireless microphone allows remote operation up to 25 feet from the radio.

FT-2200 features include:

- Wide receiver coverage, 110-180 MHz.
- 50 memory channels (odd split stored in any memory).
- 10 memory DTMF auto dialer.
- CTCSS encode built-in.
- 110-139 MHz AM "Aircraft" receive.
- High power output 50 / 25 / 5 watts.
- Built-in DTMF paging/coded squelch.
- English and Spanish operations manual included.
- Has a bright, easy-to-read LCD display.
- Includes a back-lit DTMF microphone.
- Accessories available are:
  FTS-27 CTCSS decode unit
  DVS-3 Digital voice system
  MW-2 Remote control wireless mike
  SP-7 External speaker

FT-712RH—70 cm

$497.95

FT-912RH—1.2 GHz

$709.95

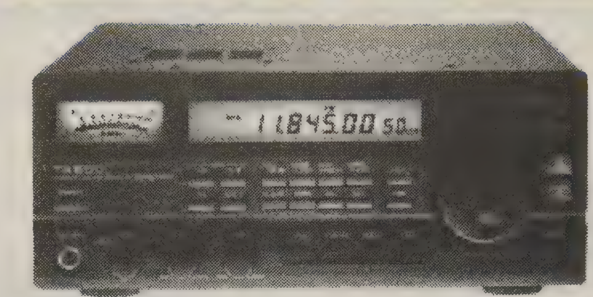
Suggested List Prices
Call for Quotes

Call for Special-- Limited to Quantity in Stock

This family of radios includes 70 cm and 1.2 GHz models in small packages for mobile use. Each unit is 1.6 inches high and weighs just a little more than two pounds. Each has an LCD display, 21 memory channels, and multiple scanning features. This radio takes messages just like an answering machine with the optional DVS-1 installed. Includes the MH-15C8 DTMF microphone.

YAESU

SWL Receiver



FRG-100

$669.95

Suggested List Price—Call for Quotes

The FRG-100 is Yaesu's newest, high-performance communications receiver providing general coverage reception in CW, SSB, AM and FM modes for 50 kHz to 30 MHz. Microprocessor control of major functions permit ease of operation and features that both new and seasoned shortwave listeners will appreciate, at an affordable price.

Reception modes and most receiver functions are push-button selectable from the front panel. A crisp back-lit LCD with adjustable brightness provide frequency read-out (down to 10 Hz) and important operating status at a single glance.

Fifty fully-tunable memory channels store frequency, mode and filter selection, two additional memories provide band-edge information used in scanning. Selectable steps of 10 Hz, 100 Hz, 1 kHz are standard, while other increments are user programmable.

Multi-function scanning (memory, band, selectable group, priority) with carrier or time-delay resume enables searching for new stations, or scanning within a known band.

A special Broadcast Band selection mode permits instant selection of 16 pre-programmed international AM broadcast bands (LW, MW through 11 meters), convenient and instant QSY.

CW operators will love the adjustable BFO, reverse BFO offset and selectable CW sideband. These features prevent having to re-tune signals when changing modes and reduces adjacent signal interference. Installation of the optional 250 or 500 Hz crystal filter permits even further enhanced CW reception.

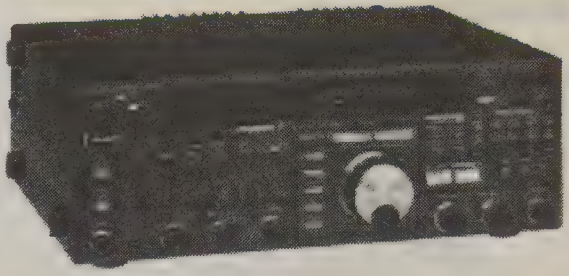
An adjustable SSB carrier offset permits fine tailoring the receiver's audio response to you own tastes. Selectable AGC rate, noise blanker and all-mode squelch and RF attenuation controls are also provided.

Twin 12/24 hour programmable clocks with hourly time annunciator let you keep local time along with another time zone. The programmable On/Off Timer and Sleep Timer along with a remote control jack at the rear of the radio can switch auxiliary recording equipment at programmed times.

The Yaesu CAT System provides a direct link to the CPU in the FRG-100. This allows a personal computer with the Yaesu FIF CAT Interface Unit to add or customize functions such as automatic tuning and scanning as well as remote control of most receiver functions.

Options include: **FM Unit 100** FM Receiver Unit
TCXO-4 Temperature Compensated Crystal Oscillator

VHF / UHF Base



FT-736R—Multi-Band

$2149.95

Suggested List Price—Call for Quotes

Designed to meet the needs of the most demanding VHF and UHF operators, the FT-736R includes 144 and 430-450 MHz as standard. Optional units are available for 50 MHz, 220 MHz and 1.2 GHz bands.

User installable band modules provide 10 watts output on the 50 MHz and 1.2 GHz bands, and 25 watts on the other bands. The FT-736R is **THE** radio of choice for satellite operation.

Operating features include IF shift and notch, noise blanker, all-mode VOX and 3-speed AGC. GaAs FET RF amplifiers in the modules above 430 MHz assure low noise and high sensitivity, and a TCXO reference oscillator meets the requirements of specialized UHF applications. One hundred general purpose memories, ten full duplex cross-band memories and five call-channel memories all store mode and receive and transmit frequencies independently.

Fourteen VFOs are provided: two general purpose plus one PMS (Programmable Memory Limit Scanning) on each band, two full duplex VFOs, and up to four clarifier memories. Each of the two full duplex VFOs can be selected so that its receive and transmit frequencies and modes can be displayed and tuned independently, or linked to tune synchronously in opposite directions for satellite operation.

Narrow FM mode reduces adjacent channel interference in crowded areas. Automatic repeater shift and a center tuning meter are useful for FM repeater operation.

A T/R switched DC supply provided for masthead preamps is activated from a front panel switch. AFSK input directly to the modulator is provided for high performance packet operation. The enhanced CAT system allows automation and customization by an external personal computer.

Power the FT-736R from 13.5 V DC or the AC mains through its internal switched mode power supply. Optionals include the TV-736 Amateur Television Modulator / Demodulator, an electronic CW keyer, and the FTS-8 Tone Squelch Unit. The MH1B8 microphone and 600 Hz CW filter are included.

Microphones

Yaesu makes two microphones to use with their HF and VHF base station radios.

MH-1B8

$33.95

HRO Price

- MH-1B8 is the standard hand microphone that is provided with the FT-767GX, FT-757GXII, FT-747GX, FT-990, FT-650, FT-890, FT-1000 and the FT-736R. This microphone has up-down buttons on the top of the unit for controlling the frequency of the radio.

MD-1C8

$133.95

Suggested List—Call for Quotes

- MD-1C8 is the optional desk microphone that will work with all current Yaesu radios. This unit comes with a desk pedestal and has up-down switches and a VOX lock.

2m / 70 cm Dual-Band Handheld

FT-530 Dual Band

$569.95

Suggested List Price

Call for Quotes

The FT-530 is the deluxe compact grandchild of the first-ever dual-band VHF/UHF handheld, the FT-727R. Smaller than the FT-470, the FT-530 uses dual micro-processor control, permitting easier operation and more features than its predecessors.

With a die-cast alloy rear case / heat sink and thick high impact polycarbonate plastic front panel, The FT-530 provides professional-grade ruggedness ideal for demanding applications.

The LCD display and translucent keypad have selectable back-lighting modes, provide 5-1/2 digit frequency readouts and indicators for most programmable functions. Also displayed are a relative signal strength and power output on separate bar graph meters.

The FT-530 includes dual simultaneous reception of two frequencies, either on different bands or on the same band. This allows you to mix VHF/VHF or VHF/UHF reception. Separate volume and squelch controls are provided for each band.

FT-530 features include:

- Digital battery voltage display.
- 82 memory channels (41 freely-tunable memories per band that are programmable from the front panel keyboard).
- Built-in VOX w/selectable hangtime.
- Clock with alarm / timer functions.
- Dual CTCSS encode / decode built-in.
- DC jack on top panel for power from an external 13.8 VDC source.
- Extended frequency receive coverage from 130-174 MHz.
- Full-duplex cross-band operation.
- Automatic Repeater Shift gives standard repeater shifts automatically.
- Built-in TX / RX battery savers.
- DTMF selective calling and private paging capabilities.

Yaesu Handhelds

Model	Frequency	Mode	Pwr Supply	Power Out	Current Transmit	Drain Receive	Sensitivity	Height in (cm)	Width in (cm)	Depth in (cm)	Weight oz (g)	Sugg. List
FT-11	144-148 MHz †	FM	4.8 VDC	1.5 W*				3.9 (9.9)	2.3(5.5)	1.0(2.5)		$369.95
FT-23R	144-148 MHz	FM	7.2 VDC	2 W*	900 mA	19 mA	.25 µV / 12dB	4.8 (12.2)	2.3(5.5)	1.3(3.2)	15(430)	$299.95
FT-33R	220-225 MHz	FM	12 VDC	5 W	1.3 A	19 mA	.25 µV / 12dB	4.8 (12.2)	2.3(5.5)	1.3(3.2)	15(430)	$349.95
FT-41R	440-450 MHz	FM	4.8 VDC	1.5 W*				3.9 (9.9)	2.3(5.5)	1.0(2.5)		$429.95
FT-411E	144-148 MHZ	FM	7.2 VDC	2.5 W*	900 mA	150 mA	.158 µV / 12dB	4.8 (12.2)	2.3(5.5)	1.3(3.3)	13(380)	$369.95
FT-416	144-148 MHZ	FM	7.2 VDC	2.5 W*	900 mA	190 mA	.158 µV / 12dB	5.7 (14.6)	2.3(5.5)	1.3(3.3)	15(430)	$415.95
FT-816	430-450 MHz	FM	7.2 VDC	2.5 W*	900 mA	150 mA	.158 µV/12 dB	5.7 (14.6)	2.3(5.5)	1.3(3.3)	15(430)	$469.95
FT-911	1240-1300 MHz	FM	7.2 VDC	1W	900 mA	150 mA	.2 µV / 12dB	4.8(12.2)	2.3(5.5)	1.3(3.2)	13(380)	$529.95
FT-530	2m/70 cm	FM	7.2 VDC	2.0 W*	900 mA	190 mA	.18µV/12 dB	5.3(13.4)	2.3(5.5)	1.3(3.3)	18(530)	$569.95

* Power output can be increased depending on the battery pack selected † Extended receiver range and AM aircraft capabilities

YAESU

FT-11R
2 meters
$369.95

FT-41R
70 cm
$429.95

Suggested List Prices
Call for Quotes

NEW!

Yaesu's newest handhelds are a small, compact transceivers with easy operation.

Features include:

- New compact battery design—4.8 volts produces 1.5 watts output.
- Up/down volume/squelch controls are back-lit.
- Wide receive coverage on FR-11; 100-180 MHz, AM aircraft receive (110-136 MHz).
- 6 character alpha numeric display.
- MOSFET power module and TX/TX battery savers.
- 5 watts output with 9.6 VDC (optional battery required)
- Large full size back-lit DTMF keypad.
- 150 memory channels.
- Built-in DTMF paging / coded squelch.

FT-23R
2 meters
$299.95

FT-33R
220 MHz
$349.95

Suggested List Prices
Call for Quotes

Yaesu's original compact handhelds are still available. They offer the budget-minded amateur a price option in selecting a handheld. Both models have LCD display with S meter.

- Up to five watts output with optional FNB-12S.
- Multiple scanning options.
- 10 memories with 7 storing odd splits.
- Aluminum alloy case with water resistant seals.
- Optional: CTCSS encode / decode (FTS-12) and DTMF pad (FTT-4).
- Auto battery saver circuit.

Call HRO's Friendly Staff of Knowledgeable Hams

FT411E
2 meters
$369.95

FT811—70cm
$394.95

FT911
1.2 GHz
$529.95

Suggested List Prices
Call for Quotes

These ultra-compact full-featured handhelds for 2m, 70 cm and 1.2 GHz offer features only found previously in larger units.

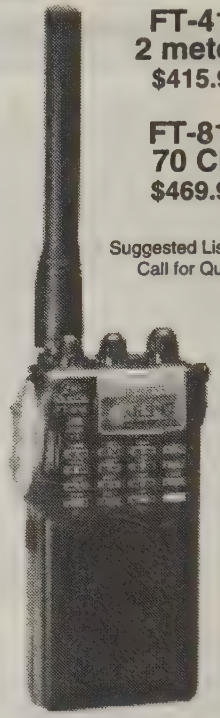
Features include:

- 49 memories and 2 VFO's.
- Multiple scanning options.
- Uses the same battery packs as the FT-23 series. The FNB-17 is the standard pack.
- Rubber gasket seals offer protection.
- Standard CTCSS encode / decode included.
- Extended receive 134-174 MHz on FT-411E.
- Backlit keyboard and large LCD display.
- Automatic Frequency Control (FT-911).
- DTMF encode pad with 10 autodial memories and direct key pad entry.
- Automatic power off system.
- VOX operation with optional YH-2 headset.

FT-416
2 meters
$415.95

FT-816
70 CM
$469.95

Suggested List Prices
Call for Quotes



Two compact handhelds from Yaesu utilize the advancements of microprocessor technology to offer the features and capabilities needed in today's hand-held transceivers. Available in black only.

Major features include:

- Up to five watts output with optional FNB-27 battery pack. Has a 5.5 to 16 volt DC supply jack.
- Construction is of a sculpted die-cast rear case / heatsink, polycarbonate front panel and battery cases, and rubber gaskets around all external control and connectors.
- Two independent VFOs and 41 memories are programmable from the keypad. Memories store independent tx/rx frequencies, offsets and scanning information.
- Multiple scanning capabilities with priority channel and CALL channel.
- CTCSS tone module is built-in.
- 10 memory, 15-digit DTMF autodialer also allows private paging using selective calling.
- Yaesu high-speed version of the Automatic Battery Saver.

Yaesu Handheld Accessories

Accessory	Model	11 41	23R 33R 73R	26 76	209RH 109RH 709RH	103R 203R 703R	411 811 911	415 815	416 816	470	530	HRO Price
Headset/Boom Mike	YH-2		*	*	*	*	*	*	*	*	*	$33.95
VOX Headset	VC-22	*										$58.95
Speaker/Mike	MH-12	*	*	*	*	*	*	*	*	*	*	$47.95
Speaker/Mike	MH-18	*	*	*	*	*	*	*	*	*	*	$39.95
Speaker/Mike Lapel	MH-19	*	*	*	*	*	*	*	*	*	*	$43.95
Speaker/Mike w/Display	MH-29										*	$105.95
Tone Squelch	FTS-6				*							$53.95
Tone squelch	FTS-12		*									$58.95
Tone Squelch	FTS-17A			*			std	std	std	std	std	$60.95
CTCSS Decode	FTS-26									*		$55.95
DC/DC adapter	PA-3				*	*						$39.95
DC/DC adapter	PA-6		*				*			*		$27.95
DC/DC adapter	PA-10	*										$60.95
DC/DC adapter	EDC-5B			*				*	*		*	$23.95
Mobile Bracket	MMB-32A		*				*					$14.95
Mobile Bracket	MMB-46									*		$15.95
Mobile Bracket	MMB-49			*				*	*		*	$16.95
Wall Charger 117 VAC	NC-9B				*	*						$11.95
Wall Charger 117 VAC	NC-18B		*	*	std	*	*	*	*	*	*	$14.95
Wall Charger 117 VAC	NC-28B		*	*			std	std	std	std	std	$13.95
Wall Charger 117 VAC	NC-34B			*								$14.95
Wall Charger 220 VAC	NC-9C				*	*						CALL
Wall Charger 220 VAC	NC-18C		*		*	*	*	*	*	*	*	$21.95
Wall Charger 220 VAC	NC-28C		*	*			*	*	*	*		$21.95
Wall Charger 220 VAC	NC-34C		*	*			*	*	*	*	*	$21.95
Quick charger	NC-15				*	*						$99.95
Quick charger	NC-37		*				*			*		$117.95
Quick charger	NC-42			*				*	*		*	$104.95
Quick charger	NC-50	*	*				*	*	*	*	*	$94.95
Battery 200 mAh 7.2V	FNB-9		*				*			*		CALL
Battery 600 mAh 12V	FNB-12S		*				*			*		$71.95
Battery 1000 mAh 7.2V	FNB-14		*				*			*		$71.95
Battery 600 mAh 7.2 V	FNB-17		std				std			std		$52.95
Battery 600 mAh 7.2 V	FNB-25			std				std	std		std	$51.95
Battery 1000 mAh 7.2 V	FNB-26			*				*	*		*	$79.95
Battery 600 mAh 12 V	FNB-27			*				*	*		*	$79.95
Battery 600 mAh 4.8 V	FNB-31	*										$53.95
Battery 1000 mAh 4.8 V	FNB-33	*										$79.95
Battery 600 mAh 9.6 V	FNB-38	*										$79.95
Battery case	FBA-5A				*	*						$19.95
Battery case	FBA-12			*				*	*		*	$21.95
Battery case	FBA-14	*										$22.95
Battery case AA batteries	FBA-17		*				*			*		$22.95
Radio case FNB-11	CSC-38						*					$21.95
Radio case FNB-9/FNB-17	CSC-43									*		$21.95
Radio case FNB-12	CSC-45									*		$21.95
Radio Case FNB-25	CSC-50							*	*			$21.95
Radio Case FNB-26/27	CSC-52							*	*			$21.95
Radio case FNB-25/FBA12	CSC-53			*								$21.95
Radio case FNB-26/27	CSC-55			*								$21.95
Radio Case FNB-25	CSC-56										*	$21.95
Radio case FNB-26/27	CSC-58										*	$21.95

Yaesu Handheld Batteries and Chargers

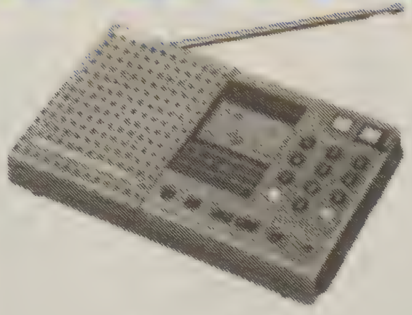
Battery	Voltage VDC	Rating mAh	Wall Charger	Desk Charger	Radio Series	HRO Price
FNB-2	10.8	425	-	NC-8	FT-208/708	$49.95
FNB-4A	12	500	NC-18	NC-15	FT-727/109/209/709	$64.95
FNB-9	7.2	200	NC-27	NC-37	FT-23/33/73/411/470	CALL
FNB-12S	12	600	NC-18	NC-37	FT-23/33/73/411/470	$71.95
FNB-14	7.2	1000	NC-34	NC-37	FT-23/33/73/411/470	$71.95
FNB-17	7.2	600	NC-28	NC-37	FT-23/33/73/411/470	$52.95
FNB-25	7.2	600	NC-28B	NC-42	FT-26/76/415/416/ 530/815/816	$51.95
FNB-26	7.2	1000	NC-34B	NC-42	FT-26/76/415/416/ 530/815/816	$79.95
FNB-27	12	600	NC-18B	NC-42	FT-26/76/415/416/ 530/815/816	$79.95
FNB-31	4.8	600		NC-50	FT-11/41	$52.95
FNB-33	4.8	1000		NC-50	FT-11/41	$79.95
FNB-38	9.6	600		NC-50	FT-11/41	$79.95

NC-50 Charger Adapters

The NC-50 quick batter charger will support most Yaesu handheld batteries. An appropriate adapter will be required. The adapters and batteries supported are shown in the table below.

Model	Batteries Supported	HRO Price
CA-7	FNB-12/14/17	$23.95
CA-8	FNB-25/26/27	$23.95
CA-10	FNB-31/33/38	$16.95

SONY



ICF-SW7600

$299.95

Suggested List Price

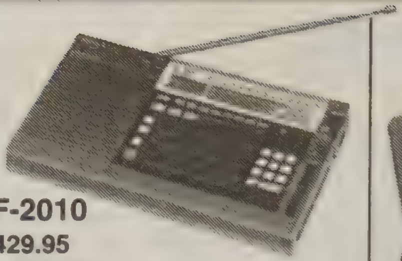
Explorers and travelers love this versatile World Band Radio® receiver with stereo FM reception and instant access to all channels and bands. The built-in clock timer with sleep and stand by functions comes in handy. Features include:

- AM (LW, MW, SW) / FM stereo reception is provided over a wide range of frequencies from LW and MW to SW and FM.
- Dual-conversion superheterodyne circuitry on the shortwave bands provides high sensitivity and interference rejection.
- 10-key Direct Access™ tuning allows station selection with the ease of a pocket calculator.
- PLL quartz frequency synthesis tuning gives accurate, drift-free frequency selection.
- SSB circuitry for reception of voice and Morse code (CW) on amateur bands.
- Manual and automatic scan tuning provides for easy frequency selection.
- Antennas include a built-in ferrite bar for MW and LW and a telescoping whip.
- An antenna jack is provided for the easy connection of external antennas.
- A large 3" speaker and tone selection provides a wide range of sound with easy adjustment.
- The display is liquid crystal (LCD).
- A high / low tone adjusts for music or news.
- Stereo headphones are supplied.
- Requires 4 AA batteries (not included) or the supplied worldwide AC adapter.

SWL Antenna

AN-1

This wide range active antenna for the short wave listener with space problems has a frequency range of 150 kHz to 30 MHz. Features a low noise FET in the built-in preamp. Built in attenuator. Requires 6 AA batteries or AC-12 adapter. Has a wide range of adapters for connecting to Sony radios. Antenna can be used inside or mounted outside. The AN-1 comes with 39 feet of cable. **HRO Price $99.95**



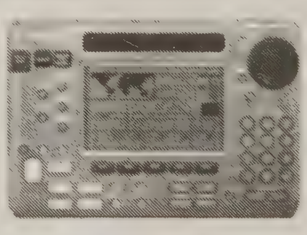
ICF-2010

$429.95

Suggested List Price

The most popular portable SWL receiver on the market is a super-compact world band radio that delivers fast direct access tuning with the utmost accuracy. Key features include:

- AM coverage from .150-29.999 MHz.
- FM broadcast band coverage.
- Dual PLL quartz frequency tuning assures optimum stability and reduces drift.
- Built-in quartz clock and 65 minute Sleep Timer with 15, 30 or 60 minute settings.
- Has BFO for receiving USB, LSB and CW.
- 32 station memory presets for instant recall.
- Memory scan tuning samples preset stations.
- Automatic band scan gives a brief sample of each station on the selected band.
- Switchable IF bandwidth with "narrow" mode.
- Comes with the AC-D3 adapter.
- The clock requires 2 "AA" (not included). **These must be installed for the radio to operate.**



ICF-SW55

$379.95

Suggested List Price

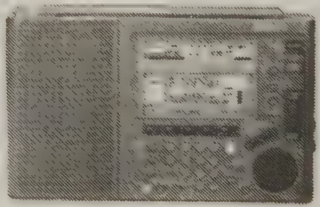
The ICF-SW55 is the step-up model for the ICF-SW7600. It includes 100 station memory presets with the ability to display station name (up to 99 page labels). Tune with 1kHz resolution by rotary dial or 10-key Direct Access™. Step and scan tuning are also included. The ICF-SW55 features SSB reception for amateur voice and Morse code broadcasts. The ROM memory eliminates the need for a battery backup. FM stereo reception is also featured. Know the time anywhere with the built-in world clock.

ICF-SW100S

$449.95 Suggested List Price

The heart of this complete world-band radio system is a multi-band receiver the size of a cassette case. It weighs only 8 ounces with batteries. The kit provided includes a carrying case, active antenna, multi-voltage AC adapter and in-the-ear stereo headphones. Major features include:

- Covers FM 76-108 MHz, 150 kHz to 29.995 MHz plus SSB.
- Access frequencies directly with 10-key pad.
- 50 station memory presets.
- Band selector for quick access to the SW bands.
- Auto-scan searches a band for signals and stops for 1.5 seconds.
- LCD readout with 24 city name/time display.
- Built-in clock with alarm, sleep timer and dual stand-by.
- Two position tone control.
- Separate active antenna for better SW reception.
- Requires 2 "AA" batteries (not supplied) or may be powered with the AC adapter included.
- Jack for an external speaker, external antenna and DC in (3 volts).



ICF-SW77

$649.95

Suggested List Price

The ICF-SW77 is the step-up model of the popular ICF-2010. It has provisions for 150 station memory presets to find your favorite station quickly. For better tuning, the ICF-SW77 features 50 Hz tuning resolution and you can enter the name of the station and it will display when the particular memory is selected.

ICOM

***Receivers with 800 MHz Receive in Limited Supply**

SWL RECEIVERS

R-9000

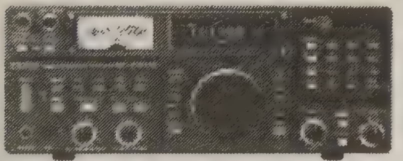
$6509.95

Suggested List Price—Call for Quotes

Icom's top-of-the-line receiver is a truly professional model. It receives from 100 kHz to 1999.8 MHz*. The radio has 11 separate bandpass filters that use GaAsFETs for the VHF and UHF bands. All modes including LSB, USB, CW, AM, FM, WFM (wide-FM) and FSK are included.

Included in the receiver is Icom's unique, state-of-the-art multifunctional CRT display with spectrum scope. The display provides information on the status of the radio as well as the incoming signals. It shows contents of the memories, dual clocks, weekly and daily timers, and frequency information of the dual VFO's.

The display doubles as a spectrum scope showing a maximum of ±100 kHz. Dynamic range is 60 dB and sensitivity is approximately 1µV.



R-71A

$1328.95

Suggested List Price—Call for Quotes

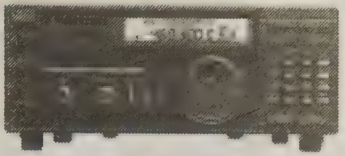
The sophisticated IC-R71A (covering 100 kHz to 30 MHz) is designed to keep you in touch with the world at all times. The IC-R71A is a versatile, multi-function receiver built for superior performance. It includes a 100 dB dynamic range, RF preamp, adjustable noise blanker, selectable AGC and tuning control or keyboard frequency selection.

IC-R100

$803.95

Suggested List Price—Call for Quotes

This is a great full-coverage receiver for mobile use. With FM, FM wideband and AM modes and frequency coverage of 100 kHz to 1.8 GHz*, the IC-R100 tunes in all frequencies of interest. It has scanning, memory and priority features to locate stations quickly. It has 100 memory channels that store mode, RF attenuator and preamplifier setting. Features include a 24 hour clock, 15dB preamp for 50-905 MHz, 20 dB RF attenuator, multiple tuning steps, all-mode squelch, AFC for frequencies above 50 MHz, automatic noise limiter, mobile mounting bracket, wire and telescoping antennas. Perfect for the serious scanner buff. AC power supply for home use $44.95



R-7100

$1647.95

Suggested List Price—Call for Quotes

Icom's IC-R7100 gives you the versatility and sophistication you demand to stay on top of the world with the latest in VHF and UHF technology. The receiver provides wideband, continuous coverage from 25 to 2500 MHz*. (Specifications are guaranteed from 25-1000 MHz and 1240-1300 MHz.) All modes are covered. With the optional TV-R7100 you can view TV broadcasts on your CRT monitor and listen to FM broadcasts in stereo. Other features include:

- Dial and keyboard entry tuning.
- 900 numbered memory channels.
- Multiple scanning capabilities with new window scan.
- Built-in clock and timer operations.
- AC/DC power operation.
- Options: CI-V system with CT-17; English frequency announcement with UT-36.

R-7000

$1592.95

Suggested List Price—Call for Quotes

Icom's R-7000 receiver covers 25 - 2000 MHz* (specification guaranteed 25-1000 MHz and 1240-1300 MHz) in AM, FM, and SSB. There are 99 memory channels with lithium battery back-up. Direct keyboard frequency access or main tuning knob. Five tuning speeds. Scan is memory or mode and programmable or priority. Features capability for computer control and has automatic tape recorder control.

YAESU

FRG-100

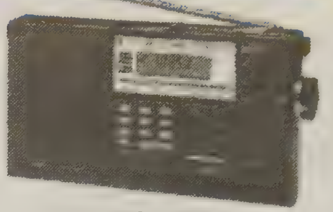
$669.95

Suggested List Price—Call for Quotes

The FRG-100 is Yaesu's newest, high performance communications receiver providing general coverage reception in CW, SSB, AM and FM modes from 50 kHz to 30 MHz. Major features include:

- LCD display with 10 Hz read-out.
- 50 fully tunable memory channels.
- Selectable standard tuning steps plus user-programmable steps.
- Multi-function scanning.
- Adjustable BFO with selectable CW sideband.
- Optional FM unit and CW filters.
- Special Broadcast Band selection mode.

SANGEAN



ATS-803A

$249.95

Suggested List Price—Call for Quotes

The ATS-803A is the perfect SWL radio for the budget minded listener. It has good performance and includes many features of the more expensive radios. Requires two "AA" and six "D" batteries. Major features include:

- AM / FM / LW and 12 shortwave bands.
- Headphones for FM stereo reception included.
- Auto-scan and BFO for SSB reception.
- Built-in clock and alarm clock.
- Includes: external antenna adapter, shoulder strap, AC converter, and a shortwave handbook.

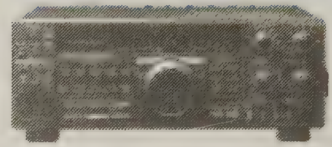
ATS-818CS

$359.95

Suggested List Price—Call for Quotes

Sangean's latest portable world band receiver with built-in cassette recorder offers more features and performance than many table top short wave receivers. It covers all SW bands from 120m to 11m, features a clock alarm, BFO for SSB and CW, FM broadcast band coverage, memories, dual time display and RF gain control.

KENWOOD



R-5000

$1179.95

Suggested List Price—Call for Quotes

This competition class communications receiver has every conceivable feature required by the serious shortwave listener. It is designed to receive all modes (LSB, USB, AM, CW, FM) from 100 kHz to 30 MHz. With the optional VC-20 converter unit coverage is extended to include 108 - 174 MHz.

R-2000

$849.95

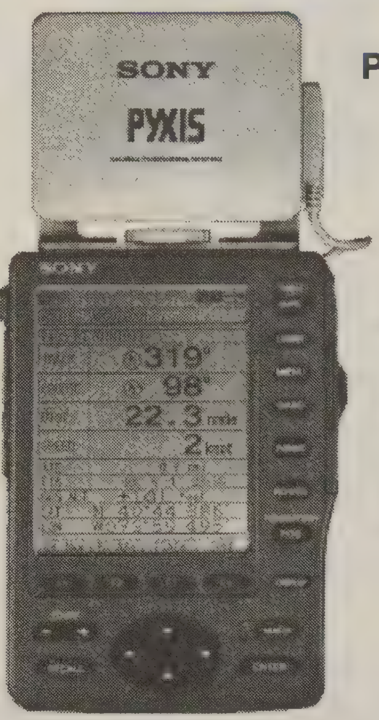
Suggested List Price—Call for Quotes

The R-2000 is an innovative all mode USB, LSB, CW, AM, FM receiver that covers 150 kHz to 30 MHz. With the optional VC-10 VHF converter unit, coverage is extended to include 118 - 174 MHz. This is an ideal general coverage receiver for the individual who is serious about the hobby but is still on a budget.

SONY

Global Positioning System

IPS-760



$1599.95 w/o database

$1699.95 w/aviation database

$1699.95 w/marine database

Suggested List Prices - Call for Quotes

The Sony Global Positioning System (GPS) receiver, Model IPS-760 is a portable, affordable, accurate way to determine your position by latitude, longitude and even altitude. Chart a course to your destination, determine your speed and time enroute, even display a graphic picture of your progress.

The ISP-760 features:

- High performance 8-channel parallel receiver automatically tracks up to 8 satellites for optimal performance.
- 1000 waypoint storage with memo capability provides greater flexibility increasing your own database with memos and graphic identifiers.
- Waterproof construction. The unit is designed to withstand a maximum submersion of 3 feet for up to 30 minutes using the supplied floatable belt.
- Interface port for data in/out capabilities with other electronic devices.
- Differential GPS upgradeable. (Feature expected in 1994.)
- 4.5" backlit graphic LCD display.
- Illuminated key pad.
- Dual IC-card slot gives the user flexibility to have optional Graphics (such as Aviation and/or Marine) Database IC-Cards or additional storage for waypoints, routes and tracks.
- Illustrates LAT/LONG grid lines while displaying your route or track, making it easy to pinpoint your starting point, present location and destination.
- Satellite performance monitor graphically displays current satellites, location, and DOP (Dilution of Precision) value.
- Quick navigation feature makes navigating to a point fast and simple.

Applications include backup for on-board marine or aviation navigation, positioning data for fishermen, terrestrial orienting and hiking. Supplied accessories: soft carrying case, mounting brackets, battery magazine, floatable belt, antenna extension cable, and utility key.

JRC

HF Transceiver

JST-245

$3499.95

Suggested List Price - Call for Quote

There are a number of reason that the JST-245 should be your next HF transceiver. Features include:

- Covers 160-10 meters plus 6 meters with all mode operation.
- Power output from 10 to 150 watts on all bands including 6 meters.
- Automatic antenna tuner is included.
- General coverage receiver from 100 kHz to 30 MHz plus 48 to 54 MHz.
- Dual VFO's with 200 multi-function memories.
- Built-in RS-232C interface for computer applications.
- Heavy duty built-in switching power supply for 115 VAC and 230 VAC operation.

SWL Receiver

NRD-535

$1995.95

Suggested List Price - Call for Quote

The NRD-535 HF Receiver is designed with features and performance to meet the needs of the new generation. It is a professional grade communications receiver which will satisfy even the most discerning listeners. Features include:

- Full coverage all mode reception from 100 kHz to 30 MHz.
- Variable tuning with high sensitivity and wide dynamic range. High precision 1 Hz step tuning.
- Various interference rejection techniques.
- Easy-to-see multi-function display.
- Remote control capabilities from a personal computer.

HF Receiver

AOR

AR-3030

$899.95

Suggested List Price - Call for Quote

Here is the newest technology in high tech receivers at an unbelievable price tag! Nothing is spared. Supports AM, SSB (USB, LSB) CW, FAX and FM. Frequency coverage from 30 kHz to 30 MHz plus optional internal VHF converter for 108-174 MHz. Includes 100 programmable memories with scanning features. Features Direct Digital Synthesizer, 10 Hz tuning and RIT for SSB/CW.

HF Linear Amp

JRC

JRL-2000F

$4899.95

Suggested List Price Call for Quote

The JRL-2000F has solved the problems that conventional linear amplifiers have had: troublesome manual operation, fan noise, low margin of output and high IMD. The JRL-2000F is a heavy duty amp using 48 MOSFET for low distortion, high speed automatic antenna tuner, high efficient switching power supply, an automatic antenna selector and wireless remote control unit. Provides 1 kW output with a maximum input of 100 watts. Shipped by truck or FEDEX only. Shipping cost extra.

Call Toll Free for HRO Discounts

Amateur 10M Mobiles

RANGER Communications, Inc.

RCI-2950

$449.95

Suggested List Price—Call for Quotes

There are now two Ranger 10 meter amateur transceivers to choose from. For low power use, the RCI-2950 with 25 watts PEP should be your selection. For those higher power requirements, the RCI-2970 100 watt unit is now available.

Ranger's RCI-2950 is all you'd expect in a top-of-the-line amateur radio transceiver and more. Built to exacting specifications for reliability, it provides a wealth of features. It has full band coverage and all mode communications. The ten most used frequencies can be pre-programmed for easy access. This is the perfect radio for 10 meter mobile use.

Specific features include:

- Full band coverage 28.0 - 29.6999 MHz.
- All mode operation (USB, LSB, CW, AM, FM).
- Large, easy-to-read backlit LCD display with four-step LCD brightness control.
- Tuning steps 100Hz; 1, 10, & 100 kHz, 1 MHz.
- CTCSS encoder / decoder (optional).
- Repeater offset switch with standard offsets.
- Built-in dual VFO .
- RIT for fine tuning up to ± 3 kHz.
- Selectable programmable tone.
- Squelch eliminates background noise.
- Transmitter output of 25 W PEP for SSB, 12 w CW and 8 w AM / FM.
- Noise blanker.
- RF gain control and RF power selector.
- Multi-function LCD meter shows transmit power, receive signal strength, modulation, and SWR.
- Receive sensitivity AM 0.5 µV, SSB .15 µV, FM .25µV.

RCI-2970

$599.95

Suggested List Price—Call for Quotes

Ranger's newest 10 meter HF transceiver has similar performance and features to the RCI-2950. It provides **100** watts PEP output for ten meter amateur operations. This will be perfect as the band conditions decline. Dimensions are 15" long, 10" wide and 6.25" high.

Amateur HF Transceiver

NEW!

SGC

SG-2000

$1995.95

Suggested List Price—Call for Quotes

SGC has added an all-frequency HF transceiver to its line of fine products. The SG-2000 is a rugged commercial grade HF transceiver that provides 150 watts PEP output. It comes programmed with 644 ITU channels and 100 user defined channels that can be set to the ham frequencies. The transmit frequency range is 1.8 to 30 MHz; receive range is 500 kHz to 30 MHz.

The SG-2000 can be fully controlled by any standard RS-232 protocol connector. This allows easy implementation of all digital modes. The front panel can also be removed to act as a remote head.

For more information on this HF transceiver, contact your nearest HRO store.
Note: This radio must be special ordered.

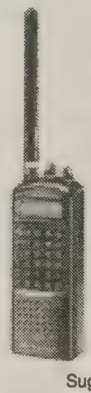
uniden

800 MHz Units Available While Supply Lasts

BC-200XLT

Suggested List Price **$329.95** Call for Quotes

This handheld scanner covers all normal scanner frequencies plus the 800 MHz bands. (Cellular is locked out.) Keypad entry of all frequencies stored in 200 channels with 10 scanning banks. Features: priority channel, aircraft, weather search, squelch, lockout, track tuning, direct channel access and delay. Customized rubber duck antenna, NiCd battery pack, wall charger and carrying case included.



BC-2500XLT

Suggested List Price **$699.95** Call for Quotes

Continuous band scanner up to 1.2 GHz. Fully programmable with 400 channels, 20 banks, 20 priority channels, auto store, VFO knob, WX search, Turbo scan, step select, rechargeable NiCad battery with AC adapter.

BC-800XLT

Suggested List Price **$549.95** Call for Quotes

This 800 MHz base station scanner features forty programmable channels cover 12 bands from 29-912 MHz. Selected features include:

- Instant weather automatically finds the National Weather Service in your area.
- Scan delay adds a 3-second delay on desired channels to prevent missed transmissions.
- Direct channel access with fluorescent display.
- Automatic search automatically finds new channels.
- Track tuning allows scanner to peak on each transmission.
- Has two telescoping antennas (one for 800 MHz).
- Requires 117VAC or 13.8 VDC. 2AA size memory back-up batteries are required (not included).

BC-8500XLT

Suggested List Price

$599.95

Call for Quotes

Continuous band scanner through 1.3 GHz. Fully programmable with 500 channels, 20 banks, 20 priority channels, dot matrix alpha numeric illuminated display, auto store, VFO know, WX search, Turbo scan, aux tape output, weather alert, selectable delay, reception counter, step select.

BC-890XLT

Suggested List Price **$489.95** Call for Quotes

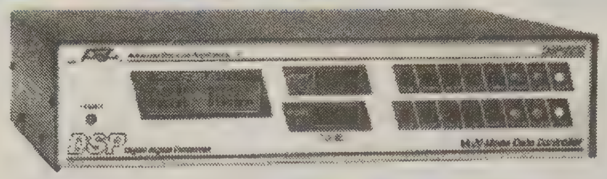
Continuous band scanner through 956 MHz. Fully programmable with 200 channels, 10 banks, 10 priority channels, auto store, VFO knob, WX search, Turbo scan, aux tape output, WX Alert, illuminated LCD display, reception counter, step select.

BC-760XLT

Suggested List Price **$499.95** Call for Quotes

This mobile scanner includes 800 MHz coverage (with cellular locked out). It features:

- 100 programmable channels organized in 5 scanning bands of 20 channels each.
- Automatic scanning of preprogrammed aircraft, police, marine and emergency services.
- Weather search, priority, squelch, lockout & delay.



Now With Gateway

Data Controllers

DSP-2232 DSP-1232

$1195.95 **$799.95**

Suggested List Prices—Call for Quotes

These state-of-the-art controllers use digital signal processing (DSP) technology with the Motorola 56001 processor. Built-in software modems include all PK-232 modems, all satellite modems (400, 1200, 4800 and 9600 eq bps for PACSAT and OSCAR), 9600 bps K9NG / G3RUH, Analog FAX HF and APT, Analog SSTV, 2400 bps DPSK and more. All features of the PK-232 are included and more. The DSP-2232 has dual simultaneous ports and a multi-purpose LCD display. The single port DSP-1232 has no LCD. Both units include PACTOR and Gateway. Up/down doppler shift for PSK modems and outputs for up/down frequency stepping to control the radio's frequency have been added. Cables and connectors included. 12 VDC required.

NEW!

WeFAX 256

$129.00

Suggested List Price—Call for Quotes

New Windows WeFax program for the DSP 2232/1232 displays in real time, true grayscale images from the NOAA HF WeFax service or the NOAA APT satellite service. Includes a complete image processor to enhance received images.

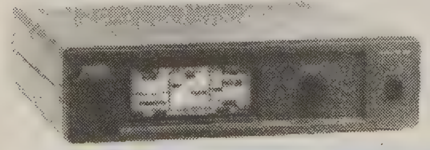
NEW!

ST-1

$399.00

Suggested List Price—Call for Quotes

The ST-1 satellite tracker provides hardware and software for automatic tracking of satellites. Automatically controls the Yaesu 5400 / 5600 azimuth-elevation rotators. Works with InstantTrack, QuickTrack and RealTrack software. Provides initial tuning and Doppler correction during satellite pass.



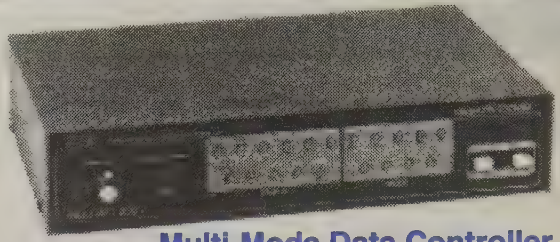
Now With Gateway

PK-900 Multi-Mode Data Controller

$569.95

Suggested List Price—Call for Quotes

The PK-900 is the best "standard" multi-mode controller available anywhere. It features dual-port operation and also has low-cost options available for 9600 bps and gray scale fax. This product is the successor to the PK-232 and includes Packet, ASCII, Baudot, Morse Code, AMTOR, NAVTEX, TDM, SIAM, PACTOR and Gateway. Gateway from packet to AMTOR, packet to PACTOR and packet to packet included. Even Gateway as a node. Allows packet users connecting to Port 2 to monitor and link to other AMTOR, PACTOR and even packet stations using an HF radio on Port 1. Cables and connectors included. 12 VDC required.



Now With Gateway

Multi-Mode Data Controller

PK-232MBX

$399.95

Suggested List Price—Call for Quotes

This is the most popular multi-mode controller ever made. It features an RS-232 compatible controller for Packet, Baudot and ASCII RTTY, AMTOR / SITOR ARQ and FEC, Morse code, WEFAX, PACTOR, and Gateway. It receives NAVTEX / AMTEX and TDM. The controller has a superior filter design (17-pole effective filtering) for better copy; built-in 18K byte PakMail™ personal packet maildrop with auto forwarding; SIAM™ for automatic RTTY signal identification; KISS mode for TCP/IP compatibility; and Host Mode for user-friendly software interface. Cables and connectors included. 12 VDC required.

NEW!

PK-96 High Speed Packet Controller

18K: $229.00 **100K: $279.00**

Suggested List Prices—Call for Quotes

The PK-96 1200/9600 baud packet controller comes standard with 1200 baud AFSK tone signaling as well as 9600 baud K9NG and G3RUH compatible direct frequency modulation. Excellent terrestrial or satellite data controller. True DCD state machine. Modem disconnect header. Identifies TCP/IP, NET/ROM and <The Net> stations. Automatically receive and reverse-forward messages and control third party traffic. Comes in two models: 18K maildrop and 100K maildrop.

PK-88 Data Controller

$179.95

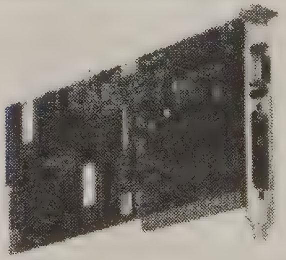
Suggested List Price—Call for Quotes

This is the easiest way to get started with amateur digital communications. The PK-88 features the same packet commands as the PK-232. Includes Host Mode and 18K byte Packet maildrop. It is AX.25/L2/V2 compatible. Includes advanced features such as KISS mode and NET / ROM compatibility for the advanced user, and it is easy for the new user to learn. 12 VDC required.

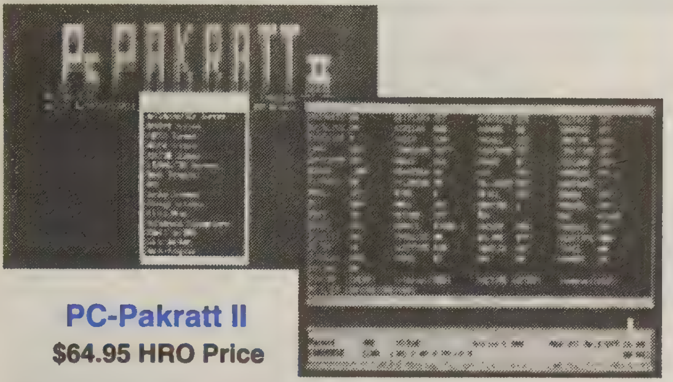
PCB-88 PC Plug-in Data Controller

$179.95

Suggested List Price—Call for Quotes



This full-featured IBM compatible Packet controller plugs into an 8-bit expansion slot in your IBM PC, XT, AT or compatible. It includes all features of the PK-88 controller and more. The packet-only version of PC-Pakratt II software (called PC-Pakratt-88) is also included. With the included external 12 VDC supply, the unattended PCB-88 mailbox can operate with the computer turned off. The unit includes true packet DCD sensing circuit, built-in modem disconnect header.



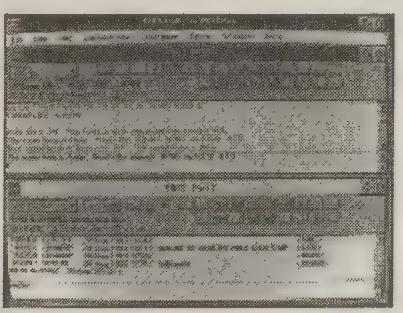
PC-Pakratt II

$64.95 HRO Price

IBM-Compatible terminal control program for the PK-232; menu-driven; works with or without a mouse.

You get full Host Mode support for the latest PK-232 command set; built-in QSO logging facility; fast-initialization cuts start-up time down to a few seconds; disk and printer access for all PK-232 functions including PACTOR, SIAM™ screen for quick and easy signal identification; DOS gateway; supports COM 1- 4.

Includes latest version of the PK-FAX program to display received facsimile images on screen, save to disk and more. Can run PK-FAX without leaving the program. Command line switches allow you to change baud rate, COM port, mode, etc. easily. Complete parameter screens.Context-sensitive help.



PC Pakratt for Windows

$119.95 HRO Price

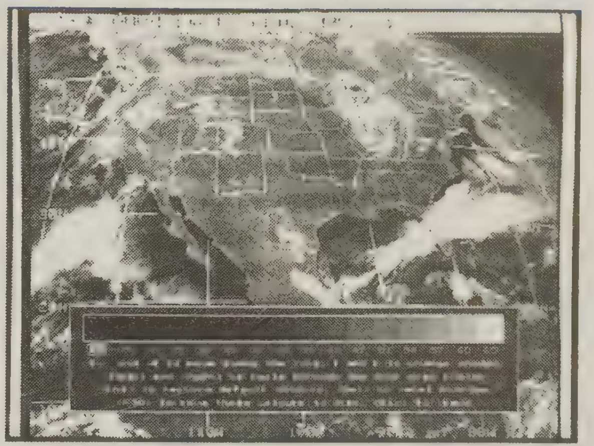
The only data controller software for Windows™ on the market today. Requires Windows 3.1 and 4 Mb of free hard disk storage.

Works with all AEA data controllers, including the PK-900, DSP-1232 and DSP-2232, as well as the industry standard PK-88 and PK-232MBX. PC Pakratt for Windows supports simultaneous dual-port operation, making it ideal for use with the PK-900 and DSP-2232.

PC Pakratt for Windows is a true Windows™ application, letting you run other programs while controlling your data controller. Other Windows functions include cut and paste from other applications, "point and click" access, selectable screen fonts and on-screen status. PC Pakratt for Windows can run minimized or in the background, if desired.

Software is sold on a non-returnable basis. Any software problems will be resolved under the terms of the manufacturer's warranty.

AEA Software — designed with flexibility and performance in mind.

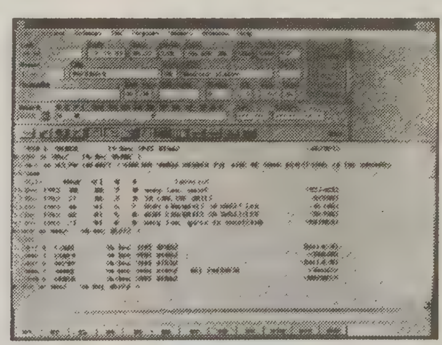


AEA-FAX II

$99.95 HRO Price

IBM-compatible hardware and software to receive and display facsimile and wire photo images; **the right way** to do multiple gray levels--not by putting an analog mode into a digital multi-mode controller; 16 gray levels in VGA mode.

Decodes CW, RTTY and NAVTEX. "Daisy-chain" RS-232 input so your TNC, modem or other device can be used on the same COM port. Features "slide-show" mode; tuning scope visible even when receiving an image on screen; auto-save ability; shielded audio cable; 5-1/4" and 3-1/2" disks included. Supports CGA and EGA.

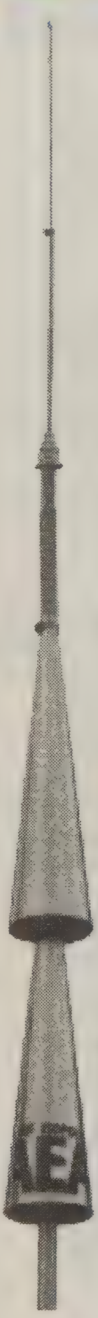


Log Windows

$99.95 HRO Price

Log Windows is as fully integrated, easy-to-use Windows program. It combines the functions of logging, rig control and DX Cluster monitoring with award tracking and reporting. Supports ICOM, KENWOOD and newer YAESU radios. Import data from major logging programs such as CT, Easy-DX, Hyperlog, LogMaster and DXBase. Incorporates comprehensive database for storage of QSO information. Interfaces to SAM and Buckmaster on-line callbooks for automatic display of name and QTH when a call sign is entered. Award types include DXCC mixed, phone, CW FSK, bands; CQ mixed, SSB, CW, FSK, bands; WAS mixed, SSB, CW, FSK and bands.

ANTENNAS & ACCESSORIES



IsoPole™ VHF / UHF Antennas

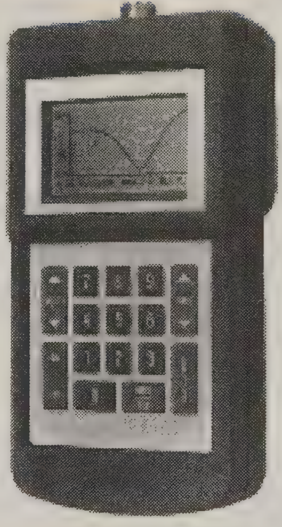
Three models are available: 144 MHz (pictured left), 220 MHz, and 440 MHz. These antennas provide the maximum gain possible for their respective lengths. Zero degree angle of radiation gives maximum range. Exceptional decoupling results in simple tuning and significant reduction in TVI potential. Broad frequency coverage. Typical SWR less than 1.4 to 1 or better across the entire band. Mast not included. **144 $59.95; 220 $59.95; 440 $89.95**

Hot Rod™ Handheld Antennas

AEA'S high performance hand-held antennas are available in two models: **HR- 1** for 144 MHz and **HR- 2** for 220 MHz. These models provide maximum gain and extended range—higher gain than any 5/8 wave telescopic antenna for handhelds for their respective bands.
HR-1 $19.95; HR-2 $19.95

Antenna Analyst

SWR-121



The SWR-121 handheld Antenna Analyst provides comprehensive antenna performance information in an easy-to-read graphic format. The SWR-121 has an LCD spectrum display which plots an SWR curve for any HF, VHF or UHF antenna.

Also displays a return / loss measurement for the coax on the LCD readout. Frequency coverage of the SWR-121 is 1 to 32 MHz. SWR-121 V/U 120-175 MHz, 220-225 MHz and 400-475 MHz with an SWR range of 1.1 to 65.1. The SWR-121 can be powered by AA batteries or with 12-16 VDC (not supplied). **HRO Price SWR-121 $349.95, SWR-121 V/U $399.95**

AACOM Software for the SWR-121

An innovative feature in the SWR-121 Antenna Analyst is the ability to link to a computer with the optional AACOM software. You can down load an SWR plot stored in the Antenna Analyst to your PC for future reference or comparison. **HRO Price $75.95**

IsoLoop™ Model 10-30 HF Antenna

AEA's compact antenna covers 10-30 MHz continuous (including 12, 15 and 17 meters). It is ideal for apartments, condominiums, RVs, and portable use. Also great for the ham who wants to avoid the hassles of a high-priced high-gain yagi and tower guy wire, turnbuckles, insulators, concrete, guy stays, rotators, construction permits, etc.

The IsoLoop is isolated from the feedline to keep stray RF to a minimum. Narrow bandwidth reduces TVI potential and attenuates out-of-band signals. The antenna handles up to 150 watts. It weighs only 17 lbs and can mount in an attic or on an apartment balcony. The LC-2 controller of the IsoLoop 10-30, power supply and 50 feet of control cable supplied.

Tuning is accomplished with the small LC-2 remote control box (supplied) which sits in the ham shack (50 ft motor cable also supplied). The IsoLoop has an omnidirectional radiation pattern when mounted in the horizontal plane. Vertical mounting provides a null in a desired direction. Maximum radiation is always at lower angles than a dipole at the same elevation. **List Price $389.95**

IT-1 IsoLoop 10-30 Auto Tuner

The AEA IT-1 is an optional automatic tuner for the IsoLoop 10-30. Ten segment LED bar monitors tuning process and indicates selected memory number. Twelve-button keypad with audible beep announces completion of the tuning process (1-5 seconds typical tuning time). Thumbwheel knob for manual control. Serial interface for remote control. Tunes for maximum noise or minimum noise. **HRO Price $249.95**

DRSI

PC* PACKET

DRSI
DPK-2
dcd
ptt
con
sta
pwr

DPK-2
Packet Radio TNC

NEW!

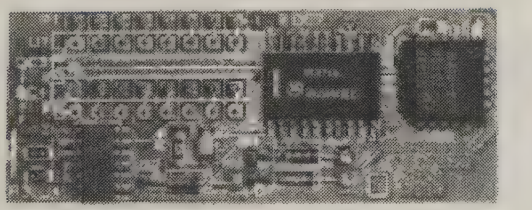
$114.95
HRO Price

The DRSI DPK-2 is a compact, low-power, all-CMOS packet radio TNC. It has 100% firmware compatibility with the TAPR TNC-2 and runs NET/ROM and ROSE, too. The DPK-2 comes standard with Version 1.1.8 firmware, enhanced with a Personal BBS. The DPK-2 has a "no-tune, crystal-controlled modem that is always right on frequency for 1200 baud operation. Its RS-232 serial port supports speeds up to 19,200 baud, with option TTL outputs. The modem disconnect header works with any standard external modem, including G3RUH and Satellite PSK designs. All of this comes in an attractive package just 1.25"h x 5"w x 6.25"d.

- Low Cost.
- High Performance.
- TNC-2 Compatible.
- All CMOS for low currant.
- Runs all TNC-2 proms.
- Comes with version 1.1.8.
- Personal BBS included.
- KISS mode.
- Modem disconnect header.
- Draws only 45ma at 12VDC.

Modem Upgrade

DCD-3105
"Open-Squelch" Board



For PCPA Type 1, Type 2, and DPK-2

Experts recommend that every packet radio station upgrade its modems with a data sensitive carrier-detection circuit. The DCD-3105 is the quickest and simplest way to improve the TCM3105 modem's performance. Radio squelch stays open since the DCD-3105 discriminates packets from background noise. With an open squelch, the modem detects packets faster and has fewer collisions for better throughput. **HRO Price $31.95**

For efficient service, HRO ships from the store nearest you.

NEW!

DRSI
DPK-9600
dcd
ptt
con
sta
pwr

$249.95
Suggested List Price

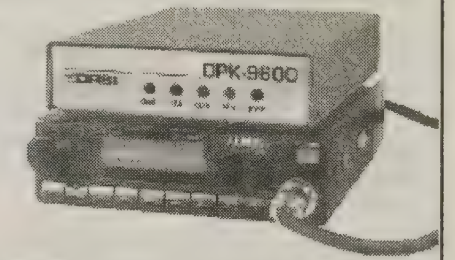
DPK-9600
High-Speed Packet Radio TNC

For "plug-and-play" packet radio, try the DPK-9600. On a single board, it features a TNC and a direct FSK modem that can be jumpered for 4800, 9600, or 19200 baud. It is compatible with earlier K9NG and G3RUH modems, but provides improved sensitivity and reduced transmit phase jitter.

DRSI's new single chip design boosts reliability. The low-power CMOS parts reduce power consumption and reduce the heat generated during operation.

The DPK-9600 is 100% code compatible with any TNC-2 clone firmware. It is supplied with Version 1.1.8a firmware. It will run all network PROMs with no modifications. Connect to your radio's varactor and discriminator via a standard 5-pin DIN socket.

DR-96-145
Plug-and-Play Combination



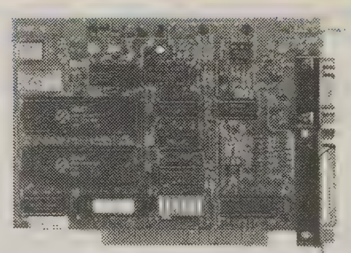
$549.95
Suggested List Price

Take the hassle out of setting up a new packet station. DRSI will provide a matched set: the DPK-9600 and a "Special Edition" modified Alinco DR-1200T 2-meter radio. The factory mod lets the DR-1200T handle 9600 baud just like 1200 baud. The pair is factory matched and all levels are set. Your station will work right out of the box.

PC*Packet Adapters

Type 1 - One Port
$149.95

Type 2 - Two Ports
$179.95
HRO Prices

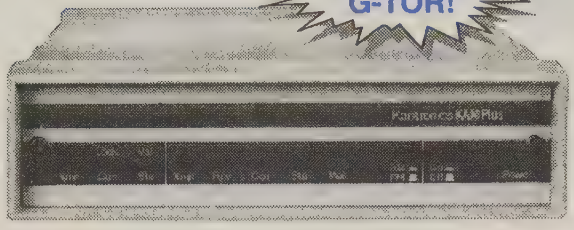


The PC*Packet Adapter provides a complete dual-port packet radio system inside your PC. The PC*PA is contained on a half-length plug-in card. It uses the 8530 SCC for hardware HDLC and a low-power CMOS crystal-controlled modem Chip. The modem is always on frequency with no tuning. The Type 1 has one 1200 baud port and makes an ideal starter system. The Type 2 has two 1200 baud ports for completely independent dual port VHF/UHF operation. The PC*PA supports all major BBS programs and the G8BPQ Node software.

Kantronics

KAM Plus

Now with G-TOR!



Modes: VHF / HF Packet, RTTY / ASCII, AMTOR (476 & 625), CW, NAVTEX, Host Mode, Kiss Mode (TCP / IP), Gateway, Weather Facsimile (WEFAX), KA-NODE, PBBS (personal packet bulletin board), REMOTE Access, PACTOR on HF and G-TOR on HF.

PBBS can be accessed on Packet, Pactor or AMTOR Mode A (ARQ). PBBS supports Bulletin ID's, forwarding and reverse forwarding, NTS traffic, personal and bulletin messages.

Simultaneous operation of HF and VHF packet. KA-Node and PBBS are available while you use other HF modes. Use with Host Master II allows simultaneous 1200 baud packet operation on VHF & any HF mode: RTTY, ASCII, AMTOR, CW, NAVTEX, PACKET, Pactor or G-TOR.

Remote access (password protected) to all commands in the TNC from a second station. Full SYSOP access to the PBBS available from a remote station in packet mode.

Selectable CW bandwidth & center frequency.

Preprogrammed 170, 425, and 850 Hz shifts, plus user definable shift (mark and space tones).

Automatic generation of unique 7 character (CCIR 625) selcal of your amateur call sign. Copy the ARRL bulletins using NAVTEX mode to prevent duplicates.

Wide bar graph tuning indicator makes tuning HF signals easy. Reliable, fast-acting AGC eliminates the need for a manual threshold adjustment.

More features listed below.

KAMs & KPCs also include:

Software Carrier Detect, when on, will only detect carrier when packet signals are present so you can run open squelch to detect weaker signals.

Personal Packet Mailbox (PBBS) features: programmable size, forwarding and reverse forwarding, capability of rerouting connects to PBBS. Battery backup will store messages when unit is turned off, optional Smart Watch will store messages, and keep date and time when unit is off.

Weather Facsimile (WEFAX) Reception. (Optional special computer program needed. For the PC ask for SuperFax II.)

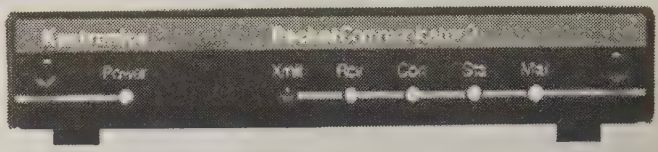
Full-duplex capability with the KAM Plus.

Compatible with any computer with an asynchronous serial I/O port using standard ASCII, RS-232 or TTL voltage levels jumper selectable (can be used with RS-422). Computer must be running a terminal program like you would use with a telephone modem. Kantronics offers PC-Combo for PC compatibles. Includes two terminal programs and a WEFAX program.

AC / DC transformer, cables, and connectors for unit included. (Not included with KPC-3 and KAM Plus.)

NEW!

Enhancement Board available for all other KAM models will give them all the features of the KAM Plus (max 128K bytes RAM). Call for information.



KPC-3
VHF / UHF TNC

The KPC-3 is a small-sized, low-power packet TNC designed with the new user in mind. The simplified command set allows you to start quickly, and then switch to the full Kantronics command set when you are ready. Operating on 6-25 volts DC, requiring less than 40 milliamps, this unit is perfect for portable or other low-power applications. The KPC-3 comes standard with 32K RAM, but can be expanded to either 128k or 512k bytes. The KPC-3 supports WEFAX reception with an optional special program.

NEW!

Updated eprom in the KPC-3. Version 5.1 now features an enhanced mailbox and expanded KA-Node capability.

Software

Host Master II+ for Macintosh or IBM

The **Host Master** terminal program provides a great way to carry on a packet conversation (or several conversations), monitor what else is happening on the channel, and keep everything separate. Plus, with the KAM, work any HF mode (except WEFAX) at the same time.

The Monitor Window displays all incoming packets allowed by the TNC monitor commands. The Packet Receive Window area is actually many windows on top of each other, one for each stream, and a command window. Use PgUp and PgDn keys to go to the next channel (window) or use ESC for the command window.

The XmitEcho Window shows characters as they are transmitted by an HF mode. What you receive from a mode other than packet, displays in the Non-Packet Receive Window. The Transmit Window displays what you type on the keyboard and has many windows to coincide with the receive windows. Receive and transmit windows keep your conversations separate and will capture each to its own disk file.

The Host Master requires Kantronics Host Mode. Simultaneous multimode support for the KAM requires firmware version 5.0.

High Speed Data Radio

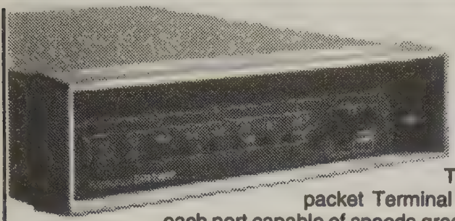
D4-10

The D4-10 is a high-speed, wide bandwidth, medium power UHF (70cm) FM transceiver. This is the second in Kantronics line of specialized high-speed data-ready radios. Coupled with the Kantronics Data Engine and DE 19K2/9K6 modem, this radio provides high speed packet operation in an off-the-shelf, no tweaking system. Rated for 10 watts output, this radio features a double helical front-end for excellent IMD and image rejection—perfect for your high-speed backbone node or home station.

Unusual features of the D4-10 are its two bandwidth modes: 25 kHz for operation up to 9600 baud and 60 kHz for 19.2 kbaud. Very fast T/R switching and direct access to the discriminator output and varicap modulator make this the choice for fast packet. The D4-10's built-in data slicer provides TTL level signals to your TNC on receive. Its built-in pulse shaping allows direct TTL drive as featured in the DE19K2 modem.

The rear panel features the TTL input for 19.2 kbaud operation. It has an analog input for use with standard analog modems like the DE1200, DE2400 or the G3RUH 9600 baud modem. Factory tuned for 435.55 MHz, this radio is can operate through the entire 420-450 MHz amateur band. 2nd channel available at additional cost.

RF DATA COMMUNICATIONS SPECIALISTS



Data Engine High Performance TNC

The Data Engine is a dual-port packet Terminal Node Controller (TNC) with each port capable of speeds greater than 56kB (depending on the modem installed). As shipped from the factory Port 1 has a 1200 baud modem (DE1200) installed and Port 2 is open for whatever you desire: DE19K2/9K6, PSK satellite modem, G3RUH 9600 baud modem, TexNet modem, another DE1200 modem, or one of your design. Port 1 can also be used for any of these modems. Configure your Data Engine to your needs.

The Data Engine is based on a V40 processor with a 10 MHz clock, and uses an 85C30 SCC for hardware HDLC. EPROM and RAM sockets allow up to 1/2 Megabyte of firmware and 1/2 Megabyte of RAM. Eight V40 controlled front panel LEDs and two dead front windows make this an ideal platform for the experimenter. The open architecture allows development to meet future packet needs, aided by the optional Firmware Developer's manual and optional Modem Developer's manual.

Standard firmware includes end-user AX.25, Kantronics Host Mode, KISS mode, BBS mode, PBBS and Gateway. Obtain the G8BPQ Packet Switch code and turn your Data Engine into a multi-port network node. Kantronics Data Engine is compatible with today's packet and designed for the development of future applications.

DE 19K2 / 9K6 Internal Modem

The DE 19K2 / 9K6 modem is capable of either 19200 baud or 9600 baud (G3RUH compatible) operation. Configured for 9600 baud from the factory, this modem is fully compatible with the popular G3RUH modem, using independent transmit and receive scramblers for full duplex capability.

Select 19200 baud operation for use with the Kantronics D4-10 radio by moving four jumpers. This mode uses the same 17 bit LFSR scrambler and provides direct TTL output to the D4-10 radio for plug-n-go 19200 baud packet.

DE1200 Internal Modem

The DE1200 modem is a standard 1200 baud packet modem that has three keyboard selectable carrier detection schemes: sine-wave, energy, and external. When sine-wave is selected, carrier is detected by the presence of audio sine waves (packet tones). Selection of energy defines the carrier detect as any received signal and external will rely on the carrier detect of your transceiver. This modem also has jumpers for output level, equalization, watch dog timer and interfacing to hand-held radios.

DE Jumper Board

For ease of use with other manufacturer's modems, the DE jumper board installs on the modem disconnect headers of the Data Engine and provides the signals required by most external modems to the rear panel DB-15 connector. TxD, RxD, RTxC, DCD, TOUT2 and GND are always present. TRxC CTS and DTR are jumper selectable. The on-board PTT circuit and watch dog timer may be disabled by on-board jumpers.

KTU with Weathernode

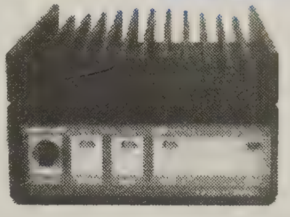
"Just Connect for the Weather" with the Kantronics Telemetry Unit (KTU) with Weathernode EPROM. Weather sensors attach to the KTU, and the KTU attaches to any brand TNC. Then anyone can connect and request weather statistics, via packet.

The KTU with Weathernode comes with a temperature sensor and will accept up to 7 sensor inputs. An optional anemometer is available which will provide wind speed and wind direction information. For those interested in weather watch programs, this is the ideal application for that unused serial port on your local area digipeater. Just add a Weathernode to each site, and you can gather current conditions around the area.

The Weathernode also stores data, so histories of past readings are available, allowing you to plot trends over time on your computer.

VHF / UHF Amps

rf concepts



VHF1-60

This high power RF amplifier is the perfect mate for your handheld radio. Given 1 to 8 watts input, this amp's sensing circuit detects the HT's output power on 2 meters and automatically switches the amp in-line for a full 60 watts output.

For reliable performance and low maintenance, the VHF1-60 has SineSink™ heat sink and flow soldered assembly. This amp also provides a 2 meter discriminator to eliminate false keying by out-of-band signals, a high VSWR LED indicator, ALC output power control to protect against antenna mismatches, transmit LEAD and thermal shutdown with thermal LED.

When used with a dual-band HT, 70 cm (440 MHz) power is passed on to the antenna without amplification. For high RF environments such as crowed cities, an optional three-resonator Helical filter, which reduces the out-of-band interference that can often overload HTs, is available for 2 meter operation only. The VHF1-60 measures a compact 5x9x3 inches and uses 13.8 VDC at less than 14A.

GaAs-Fet Receiver Preamps

Most rf concepts amplifiers feature automatic keying, thermal protection, VSWR shutdown, GaAs-Fet preamps and flow soldered assembly. All solid-state. Made in U.S.A.

Call for more information on specific models and for HRO's Discount Prices.

Dual Band 2m / 440MHz

RFC 2/70G (with preamp)
RFC 2/70 (no preamp)
143-149, 5 W in = 30 out
430-450, 5 W in = 20 out
RFC 2/70H
2 meter, 20 W in = 200 out
440 MHz, 20 W in = 125 out

144-148 MHz 2 meters

RFC 2-23, 2 W in = 30 out
RFC 2-315, 40 W in = 170 out
RFC 2-417, 45 W in = 170 out
VHF 1-60, 5 W in = 60 out

220-225 MHz

RFC 3-22, 2 W in = 20 out
RFC 3-211, 2 W in = 110 out
RFC 3-112, 10 W in = 120 out
RFC 3-312, 30 W in = 120 out

430-450 MHz

ATV compatible
RFC 4-32, 3 W in = 20 out
RFC 4-110, 10 W in = 100 out
RFC 4-310, 30 W in = 100 out

Kantronics Prices

Model	Suggested List
Data Engine	$379.95
DE 19K2/9K6	$109.95
DE 1200	$109.95
DE Jumper Board	$21.95
D4-10	$369.95
Enhancement Board	$79.95
KTU	$319.95
KAM Plus	$339.95
Host Master II+ (PC)	$69.95
Host Master II+ (MAC)	$69.95
KPC-3	$119.95

Software is sold on a non-returnable basis. Any software problems will be resolved under the terms of the manufacturer's warranty.

BOOKS & COMPUTER STUFF

KENWOOD

Software

HamWindows™

With any HamWindows series product you get Amateur Radio operations as you have never experienced and cannot experience any other way:

- A visual interpretation of your amateur radio operations using your Kenwood rig.
- Operational advantages over normal radio operations made possible by select program features.
- A database of information on other countries, radio operators and more.

The link between a Kenwood rig and a PC comes via a series of three computer software programs that can open new windows of discovery. Each offers a unique experience and incredible operating potential.

- **HamWindows Radio Construction Set (HF,VHF)** is a low-cost entry level program that gives you a glimpse at the power and advantages of PC / Kenwood operations. **List Price $49.95**
- **HamWindows 2.3 (HF,VHF)** is an assortment of full color windows that contain your station log, a world almanac, awards tracking and more. **List Price $139.95**
- **HamWindows Plus 3.0 (HF,VHF)** provides VHF control in addition to HF. SVGA compatibility, new awards and more. **List Price $162.95**

HamWindows requires Windows 3.1

Interfaces

Computer Interface IF-232C

$114.95

Suggested List Price

Use your personal computer to control Kenwood radios. The interface in combination with its companion "Level Translator" will convert the instructions from computer to a format that the transceiver can recognize.

To use the IF-232C with Kenwood's **TS-50S** or **TS-60S**, a computer interface chip set must be installed in the radio. Order Chip Set IF-10D along with the IF-232C.

The IF-232C works directly with the following radios: **TS-450S, TS-690S, TS-790A, TS-850S** and **TS-950S. No chip set is needed.**

License Studies

MacHam Radio

MacHam Radio™ Study Guides

Study for the Amateur Licenses with the aid of your **Apple® Mac®** Computer. Material is from the latest FCC question pools. Includes diagrams on screen and is EVERYTHING you need to pass your exams! Test on screen or printed!

Morse Code Training: Vary speed from 1 to 30 WPM. Set FARNSWORTH spacing and Tone. Unlimited RANDOM WORDS and QSO's. Has many more great features!

You will be VERY impressed with these programs.

MAC Software

NO-CODE TECHNICIAN $39.95

GENERAL, ADVANCED and EXTRA
Each Version Just $34.95

MacHam Morse™ Price $39.95

Morse Software

GGTE

Morse Tutor

The GGTE Morse Tutor comes in two models, standard and advanced. The software is for the IBM PC / XT / AT and compatibles.

The eleven lessons use a flash card technique to teach you Morse code. Each session can be set up to teach only the specific lesson, a random character drill or a random word drill using only those characters learned through the current lesson.

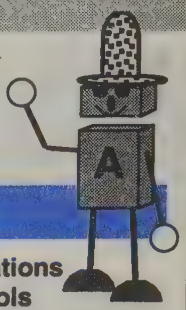
The last lesson is a random QSO generator based on a large information pool. This lesson is similar to code exams.

The program does standard CW spacing or the Farnsworth method. It is menu driven. Specify 3.5" or 5.25" disks.

The advanced version includes all the features of the standard plus the ability to enter your own text from the keyboard or imported ASCII files. Also shown is the character tally. **HRO Price $29.95**

Software is sold on a non-returnable basis. Any software problems will be resolved under the terms of the manufacturer's warranty.

artsci



Technical

Radio / Tech Modifications & Alignment Controls

Easy to follow instructions (with detailed drawings) to enhance almost all brands of amateur HT's and mobile radios. Includes extended frequency plans. **Volume A** (Icom, Kenwood, Scanners), **Volume B** (Alinco, Standard, Yaesu, Others) **HRO Price $19.95 each**

Lost Users Manuals

Lost the manual to your radio? Bought a used radio with no manual? This Lost Users Manual is the answer. It contains operating instructions on most popular VHF & UHF radios: Alinco, Icom, Kenwood, Yaesu, Uniden. **HRO Price $19.95**

Reference

U.S. Repeater MapBook

VHF & UHF repeater guide with maps of fifty states and all counties in North America. Shows the popular repeaters. A must for the travelling ham! **HRO Price $9.95**

Amateur Hambook

This book is like a mini Amateur library! Contains charts, tables, construction plans for all areas of amateur radio. Never go looking through all your other books again for that piece of information. It's here! **HRO Price $14.95**

License Preparation

Riding the Airwaves with Alpha & Zulu

Let Alpha & Zulu and other characters teach you and your kids amateur radio. Have great fun studying for the Novice and No-Code Technician tests. 288 pages of cartoons, mini tests and games. **HRO Price $14.95**

Scanner / Frequency

Federal Assignments

Ever wonder what the federal government agencies were up to? Listen in! This book, third edition, has the secret frequencies used by our government. By far this is the most comprehensive book we know of. **HRO Price $24.95**

Police & Fire Communications Handbook

With the ever changing police frequencies in Southern California, it is about time an accurate and up to date scanner book was available. More than 380 pages of frequencies, inputs & tones. **HRO Price $19.95**

Shortwave

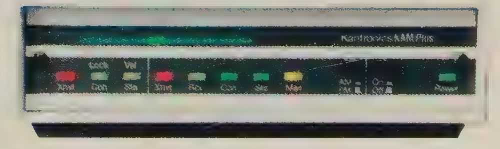
North American Shortwave Frequency Guide

A comprehensive by frequency list of all HF broadcasts by every country (worldwide) and service that can be heard in North America. **HRO Price $19.95**

Quick-N-Easy Shortwave Listening

Interested in Shortwave? Want to get a friend into shortwave? Then this is the key. Everything you need to know to make an intelligent choice. Which receiver, what type of antenna, and what to listen to. **HRO Price $3.95**

Pactor is fast. G-TOR is more along these lines.



Kantronics KAM Plus with lightning fast G-TOR

The KAM Plus strikes again. It's now available with lightning fast G-TOR, a Kantronics innovation. More than twice the speed of Pactor in most band conditions, this error-correcting mode is the fastest HF mode available in a stand-alone TNC.

In addition to G-TOR, the KAM Plus operates the other popular modes and is capable of operating an HF mode and VHF packet at the same time. The KAM Plus also features more than 100K of personal mailbox space. And like most Kantronics products, the KAM Plus is small, portable and equipped with a NEWUSER command set and on-line helps.

KAM Plus with G-TOR. Together, the two are taking HF digital communications by storm.

Kantronics

For more information, contact your authorized Kantronics dealer or Kantronics at 1202 E. 23rd St., Lawrence, KS 66046-5006 913-842-7745 FAX 913-842-2021.

FT-2500M/FT-7400H 2m/70cm Mobiles

Specifications

- **Frequency Coverage:**
  FT-2500M
    RX: 140-174 MHz
    TX: 144-148 MHz
  FT-7400H
    RX/TX: 430-450 MHz
- Rugged Military Spec Design
- Advanced Track Tuning (ATT)
- Selectable Alpha-Numeric Display
- Largest Display Available
- Power Output:
    FT-2500M 50/25/5 Watts
    FT-7400H 35/20/5 Watts
- Flip Up Front Control Panel Hides Seldom Used Buttons
- Backlit DTMF Mic
- 31 Memory Channels
- CTCSS Encode Built-in
- Automatic Power Off (APO)*
- Time-Out Timer (TOT)*
- Manual* or Automatic Backlighting Adjustment
- **Accessories:**

FTS-17A	CTCSS Decode Unit
FRG-6	DTMF Paging Unit
SP-4	External Speaker
FP-700	Power Supply

*FT-2500M

NEW
"No other mobile has a Military spec rating. This radio can really take it!"
"Backlit DTMF Mic, too. Only Yaesu radios have this."
"3-stage advanced track tuning really reduces intermod. Its great!"
"Yaesu did it again."
US MILITARY APPROVED MIL-SPEC
POWER
LOW 28
BUSY
145.000
SQL
VOL
D/MR
F/W
YAESU
FT-2500M

Performance beyond the call of duty.

Just when you thought you had the most formidable mobile built, we made the FT-2500M. It's the next evolution of powerful, rugged mobile radios.

The FT-2500M, based on the acceptance of the popular FT-2400H, takes its durable quality, features, and performance then goes one better! The FT-2500M has a new easy-to-operate front panel design with rubber coated knobs and large amber display, and the Yaesu exclusive 3-Stage Advance Track Tuning feature which reduces intermodulation and front-end overload. With its superior technology, the FT-2500M is as close as you can get to commercial grade performance in amateur frequencies.

The FT-2500M is the only mobile with a Military spec rating; the only mobile radio with the most often used controls on the front and those you "set and forget" neatly hidden; and the only mobile radio with a backlit DTMF mic. With its extra large heat sink and one-piece die-cast chassis, the tough FT-2500M is unlike any other mobile in its class.

So test the mettle of your mobile, if it doesn't measure up to the endurance standards set by the U.S. Military, you need the FT-2500M. Designed for flawless performance in rough and rugged situations, the FT-2500M is really formidable – just what you'd expect from Yaesu. See it at your dealer today!

YAESU

*Performance without compromise.*SM

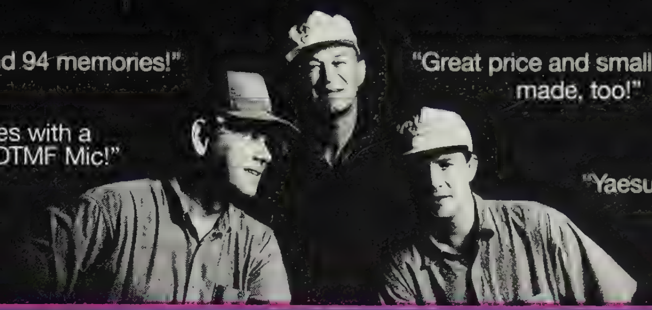
FT-2200/7200

Just 5.5"W x 1.6"H x 6.5"D, the FT-2200/7200 radios are designed to fit into today's more compact cars with ease.

SPECIFICATIONS • Frequency Coverage: FT-2200 RX: 110-180 MHz, TX: 144-148 MHz. FT-7200 RX/TX: 430-450 MHz. • Wide Receiver Coverage: 110-180 MHz • AM "Aircraft" Receive: 110-139 MHz • Built-in DTMF Paging/Coded Squelch • Selectable Channel Only Display • 10 Memory DTMF Auto Dialer • Backlit DTMF Mic • Power Output 50/25/5 Watts (FT-7200 35 Watts) • 50 Memory Channels • Remote Operation w/ Optional MW-2 • CTCSS Encode Built-in • Optional Digital Voice Storage System. Accessories: See your authorized Yaesu dealer.

© 1994 Yaesu USA, 17210 Edwards Road, Cerritos, CA 90701 (310) 404-2700

Specifications subject to change without notice. Specifications guaranteed only within amateur bands. Some accessories and/or options are standard in certain areas. Check with your local Yaesu dealer for specific details.



"Built-in duplexer and 94 memories!"

"Comes with a backlit DTMF Mic!"

"Great price and smallest dual band made, too!"

"Yaesu did it again!"

FT-5100

Dual Band Mobile

- **Frequency Coverage:**
  - 2M: 130-174 MHz RX
  - 144-148 MHz TX
  - 70 cm: 430-450 MHz RX/TX
- 94 Memories (47 per band) Odd Splits In Any Memory
- Dual in-band receive (V/V, U/U or V/U Receive Operation)
- DTMF Paging and Coded Squelch Included.
- Packet Radio TNC Jack Built-In To Back of Radio
- CTCSS Encode Built-In
- Dual Receive with Balance Control
- Full Duplex Cross Band Operation
- Built-In Antenna Duplexer
- Back Lit DTMF Microphone
- Automatic 8 Level Display Dimmer
- Built-In Cross Band Repeat
- RF Output Power:
  - 2M: 50/5 watt (high/low)
  - 70 cm: 35/5 watt (high/low)
- **Accessories:**
  - **FTS-22** CTCSS Dual Decoder
  - **SP-7** External Speaker
  - **MW-2** Wireless Microphone/Controller

The ultimate definition of Dual Band.

YAESU
DUAL BAND FM TRANSCEIVER FT-5100
146.760
146.520

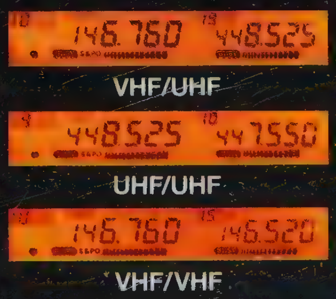
Now you can listen to two, 2 meter frequencies, or two, UHF frequencies, at the same time with In-Band Dual Receive*. Although equipped with traditional dual band, Yaesu has taken receive two steps beyond in the remarkable FT-5100. Combined in one compact mobile transceiver, it's the ultimate meaning of "dual band".

With 94 memory channels – more than any other radio in its class – and the optional MW-2 Wireless Mic, the flexibility of the FT-5100 is matchless. But to make sure the FT-5100 is complete, and an even better value, unlike the competition, there's a backlit DTMF mic included.

Through advanced miniaturization technology you'll find practical additions like the built-in antenna duplexer – an option on similar transceivers – and equally important, DTMF paging and coded squelch. All in the smallest dual band made!

Priced for the shrewd buyer, you've got to hear it to believe it. Dual band re-defined. Combinations like this can't be found anyplace else, so contact your nearest Yaesu dealer and tell him you want the "ultimate dual band". The FT-5100.

Three Dual Receive Configurations



Dual band redefined.
And the choice is yours.

In-Band Dual Receive available only on FT-5100.

FT-5200. For those who don't want in-band dual receive, choose the security of the FT-5200 with it's quick-release front control panel (*not available on the FT-5100*). Comes with back-lit DTMF mic and built-in antenna duplexer.

Here's another Yaesu exclusive!
The MW-2 Wireless Mic
with Remote Control.

YAESU

Performance without compromise.℠

In-Band Dual Receive available only on FT-5100.

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"200 watts, real cross band receive, even two flywheel-weighted main knobs!"

"Yaesu did it again!"

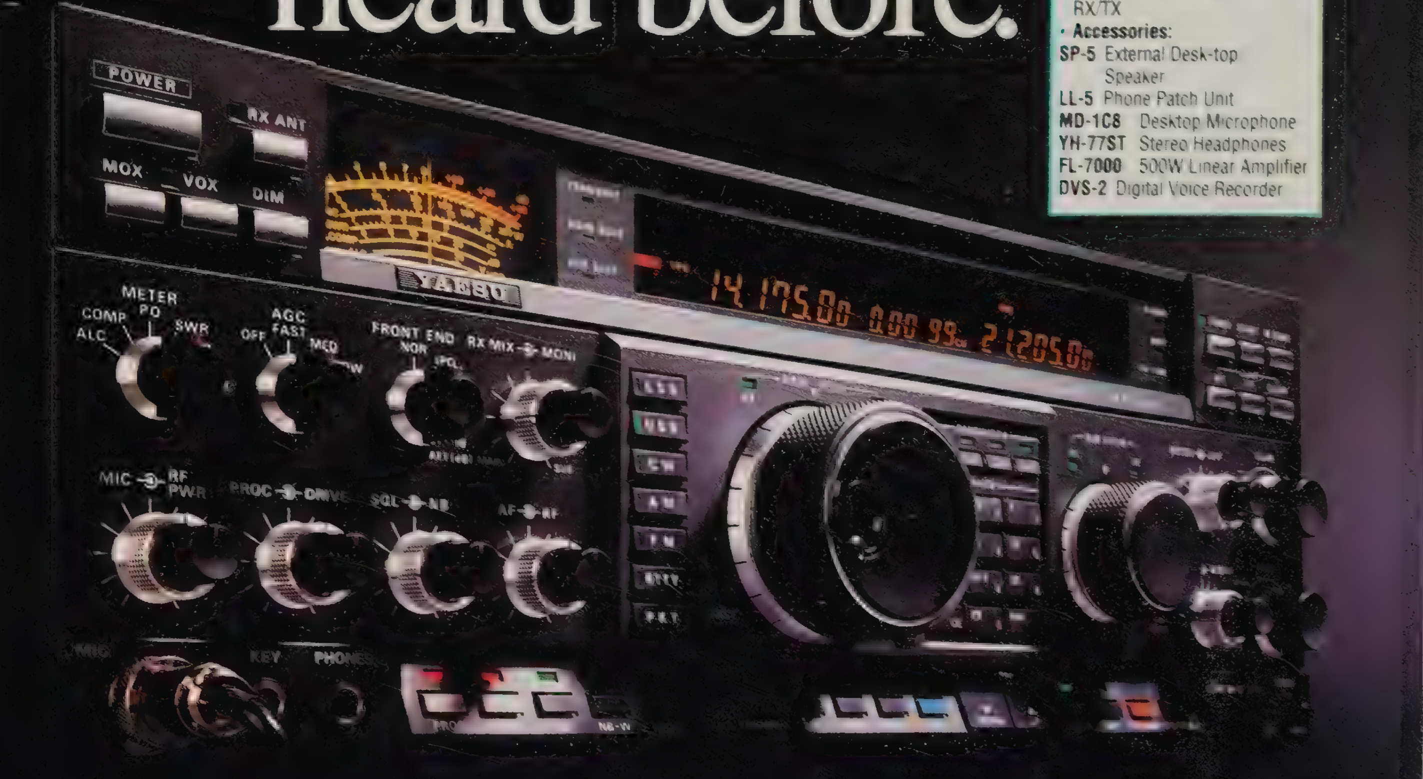
"Right, there's only one real performer – the FT-1000."

FT-1000
All Mode HF Transceiver

- RF Power Output: Up to 200 Watts
- True Cross-band Dual Receive. Two Large Tuning Knobs
- Front Panel RX Antenna Switch: For Beverage or Loop
- Direct Digital Synthesis (DDS)
- Automatic Antenna Tuner: Built-in, 30 Memories
- Frequency Range: 100kHz-30MHz (RX), 160-10 meters (TX)
- 100 Memories: Independent ATU and Mode IF Filter Memory
- CW Spot and Two CW Key Jacks for Maximum Convenience
- Dynamic Range: 108 dB
- Optional Digital Voice Recorder (DVS-2): 16 Seconds Each RX/TX
- **Accessories:**

SP-5 External Desk-top Speaker
LL-5 Phone Patch Unit
MD-1C8 Desktop Microphone
YH-77ST Stereo Headphones
FL-7000 500W Linear Amplifier
DVS-2 Digital Voice Recorder

Hear signals you've never heard before.



You're a competitor. You want optimum receiver performance and you want "muscle" on transmit. First with 200 watts – more power than any competing transceiver – and "hand warm" at maximum RF. It's easy to see why the FT-1000 has been judged "best overall" by top DX'ers worldwide.

For elite-class contesting and DX operation, exclusive features maximize your score. Dual Receive – Watch a multiplier or new country on one frequency, run QSOs on another. Diversity Reception – Use two antennas at different heights or opposite polarization. Extensive Cascaded IF Filtering – For "low end" battles.

Dramatic front panel design features two flywheel-weighted tuning knobs, RX antenna selector and two large displays.

A perfect blend of electronics and human engineering, the FT-1000 is the Best of our Best!

To hear signals you've never heard before and get the competitive edge, see your Yaesu dealer today.

YAESU

Performance without compromise.™

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"Dual Decode. Now that's a first!"

"Built-in VOX? Right!"

"Wow, a real Battery Voltage Readout!"

"Yaesu did it again!"

FEATURES	Yaesu FT-530	Kenwood TH-78A	Alinco DJ-580	Icom IC-W2A
Memory Channels	82	50	40	70
Slide-out Lithium Battery	YES	NO	NO	NO
Dual CTCSS Decoder	YES	NO	NO	YES
Battery Voltage Readout	YES	NO	NO	NO
Automatic CTCSS Tone Search	YES	NO	NO	NO
Transmit Battery Saver (Repeater & Simplex Operation)	YES	NO	NO	NO
Built-in Vox	YES	NO	NO	NO
One Touch Reverse Button	YES	NO	NO	NO
Dual In-Band Receive (V+V, U+U)	YES	YES	NO	YES
Programmable External Speaker Audio	YES	NO	NO	YES
Optional Digital Display Mic with "S" Meter	YES	NO	NO	NO
AM Aircraft Receive	YES	YES	YES	YES

The Best vs. "the rest".

FT-530
Dual Band Handheld

- Frequency Coverage
  2-Meter: 130-174 MHz RX
  144-148 MHz TX
  70 cm: 430-450 MHz RX/TX
- 4 TX Power levels
  w/FNB-26: 2.0, 1.5, 1.0, 0.5W
  w/FNB-27: 5.0, 3.0, 1.5, 0.5W
- DTMF Paging and Coded Squelch
- ADT — Auto Dial Timer with built-in clock and alarm functions
- IBS — Intelligent Band Select (prevents automatic TX band selection on scan stop)
- Backlit keypad and display with time delay
- Built-in cross-band repeat function
- APO — Automatic Power Off
- 5 Watts output w/ FNB-27 battery or 12 VDC
- 2 VFOs for each band
- **Accessories**

NC-42	1-Hour Desk Charger
FNB-25	600 mAh Battery (2 watt)
FNB-26	1000 mAh Battery (2 watt)
FNB-27	600 mAh Battery (5 watt)
FBA-12	6 AA Cell Holder
CSC-56	Vinyl Case w/ FNB-25
CSC-58	Vinyl Case w/ FNB-26/27
E-DC-5B	12 VDC Adaptor
YH-2	Headset for VOX
MH-12A2B	Speaker Mic
MH-18A2B	Lapel Speaker Mic
MH-19A2B	Mini Earpiece Mic
MH-29A2B	LCD Display Mic with Remote Functions
MMB-54	Mobile Mounting Hanger

No other dual band handheld beats the FT-530 on features for performance and ease of use. With the largest backlit keypad available, 82 memories, exclusive Dual CTCSS Decode and AM Aircraft Receive, the FT-530 is simply the best value there is.

Compare for yourself, then forget "the rest." See your dealer for the best dual band handheld you can buy. The FT-530.

YAESU

Performance without compromise.™

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In Stock at HRO Stores... Order Today!

STARTEK INTERNATIONAL INC.
FREQUENCY COUNTERS

New ATH™ Series

Say goodbye to random counting & false readings with the ATH™ Series

FIND FREQUENCIES FAST

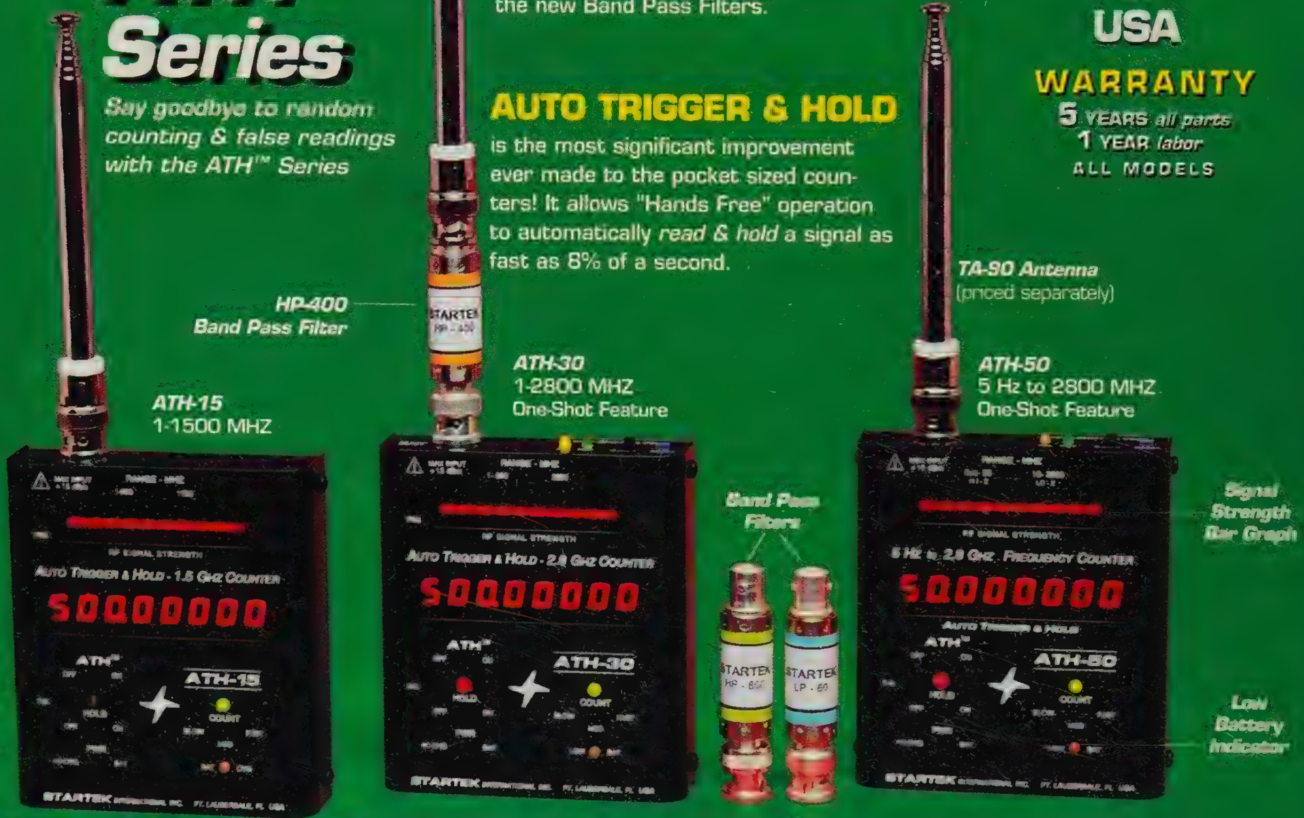
With the new, high sensitivity, ultra-fast, Auto Trigger & Hold **STARTEK** frequency counters. Increase readability distance with the new Band Pass Filters.

AUTO TRIGGER & HOLD

is the most significant improvement ever made to the pocket sized counters! It allows "Hands Free" operation to automatically *read & hold* a signal as fast as 8% of a second.

Made in USA

WARRANTY
5 YEARS *all parts*
1 YEAR *labor*
ALL MODELS


TA-90 Antenna
(priced separately)
HP-400
Band Pass Filter
ATH-15
1-1500 MHZ
ATH-30
1-2800 MHZ
One-Shot Feature
ATH-50
5 Hz to 2800 MHZ
One-Shot Feature
Band Pass Filters
Signal Strength Bar Graph
Low Battery Indicator
Size 4"h x 3.5"w x 1"d Aluminum Cabinets (No Self Tap Screws)
AUTO TRIGGER & HOLD - 1.5 GHZ COUNTER
AUTO TRIGGER & HOLD - 2.8 GHZ COUNTER
5 HZ to 2.8 GHZ FREQUENCY COUNTER
50000000
ATH-15
ATH-30
ATH-50
STARTEK HP-800
STARTEK LP-60
STARTEK

Call any HRO store for special pricing

TH, Ultra High Sensitivity Frequency Counters			List Pr
TH-10	1-1200 MHZ, No bar graph	Call	~~$179~~
TH-15	1-1500 MHZ, High speed	Call	~~255~~
TH-30	1-2800 MHZ, High speed, one shot	Call	~~299~~
TH-50	5 Hz to 2800 MHZ, one shot	Call	~~[illegible]~~
ST-15	Optional 0.2 PPM TCXO High Accuracy Timebase (installed)	Call	~~125~~
conomy Frequency Counter			
350	1-1300 MHZ, 10 HZ Res. 3 gate times, Hold switch	Call	~~129~~

and Pass Filters

crease range or distance from a transmitter with a Band
ss Filter. <1 dB pass band insertion loss.

-60	DC-60 MHZ Usage	$69.
P-400	400-1500 MHZ Usage	69.
P-800	800-2000 MHZ Usage	[illegible]
cessories		
CC-90	Case for all models	12.
TA-90	Telescope BNC antenna	12.
TA-90-L	Telescope elbow antenna	16.
RD-150	150 MHZ rubber duck	16.
RD-2750	27-50 MHZ rubber duck	22.
RD-800	800 MHZ rubber duck	29.
M-207-IC	Interface cable for MFJ-207	10.
P-110	200 MHZ, 1x, 10x probe	39.
LP-22	Lo-Pass, audio usage probe	25.
DC-10	Direct, 50 OHM probe	20.

Call or see price list for additional information.

Ni-Cads and A/C Charger INCLUDED with ALL Models

1350
1-1300 MHZ

ATH SERIES FEATURES:

- Easy to use – simple controls
- Ultra fast response time
- Extra BRIGHT LED digits
- AC or Battery operation
- Maximized sensitivity
- 8-12V auto-polarity power jack
- StarCab™ aluminum cabinet

Accessories
A
B
C
D
E
F
G
H
J
K

Call any HRO® Store for Special Prices and Ordering

Call the **STARTEK** Help Line for technical questions or model selection:
305-537-5577

STARTEK INTERNATIONAL INC.
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Attention :

DX Hunters, Contestors, Multi-Band Operators, Rag Chewers and Mobile Operators:

HIGH PERFORMANCE

BEST FEATURES

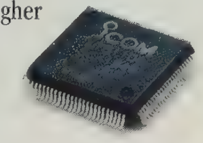
ICOM's

IC-737A

A Winning Combination of Performance and Features Previously Offered Only on Rigs Costing Thousands More!

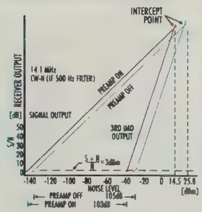
HIGH PERFORMANCE

New D.D.S. (Direct Digital Synthesizer) System – Miniaturized and improved technology provides phenomenal performance increases (higher PLL lockup speeds and improved C/N ratio, phase noise and blocking characteristics).

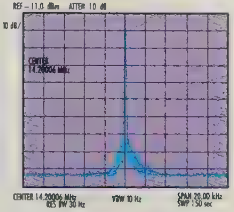


Pass Band Tuning – Electronically narrows the IF passband to eliminate interference signals (more effective than IF shift offered on competitive models).

DYNAMIC RANGE CHARACTERISTICS

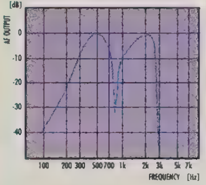


TRANSMITTER C/N RATIO

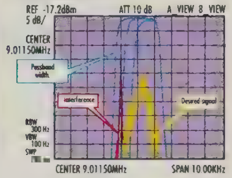


Notch Function – Tune out an interfering signal frequency to eliminate unwanted CW or AM carrier tones, while preserving the desired signal's audio response. The combination of PassBand Tuning and Notch Function is very effective on crowded bands.

NOTCH FILTER CHARACTERISTICS



PBT CHARACTERISTICS



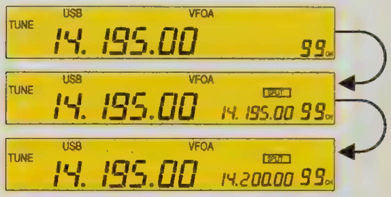
100% Duty Cycle – Large cooling fan and heatsink provide a stable 100 W in SSB, CW and FM modes (40 W in AM).

More High Performance – With full break-in (QSK), built-in electronic keyer, speech compressor, noise blanker, fast/slow AGC, preamp, attenuator, many tuning functions (including direct keypad entry) and dual CW filters (optional).

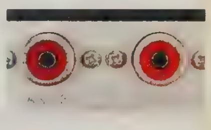
BEST FEATURES

Auto Antenna Tuner – Fast, quiet and smart, *"Spot checks showed that it could match loads with indicated SWRs as high as 10:1"* (February 1993 QST review). Auto-preset memories for each band, **including 160 M**.

Quick Split Function – Transmit and receive frequencies are **displayed simultaneously**. Both can be tuned independently. Call DX stations operating split frequency faster than any of your competition operating a single frequency display model.



Auto Antenna Selector – Two antenna connectors let you select the best antenna for band and conditions from the front panel. Stores to both band memory and memory channels.



Double Band Stacking Register (DBSR) – Memorizes two frequencies and modes **in each band**. Can be used like extra VFOs in one band. Use one register for CW and the other for SSB if you like.

10 Memo Pad Memories – Push "Memo Pad–Write" to quickly store a frequency & mode, for example, if you find a piled-up DX station. Recall just as quick with "Memo Pad–Read."

Large LCD Display – Easy to read in all lighting conditions. Won't "wash out" in direct sunlight.

MORE GREAT FEATURES

- Voice Activated Transmit (VOX)
- 101 Memory Channels
- Multiple Scanning Modes
- General Coverage Receiver
- PC Compatible (w/optional CI-V)
- Many compatible options available
- Dial Lock
- All Mode Squelch
- Carry Strap
- Opt. Mounting Bracket

ICOM
POWER
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VHS

See your participating ICOM dealer today and view a video demonstration of this product!

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ICOM®

C-T21A
/HF FM
Transceiver
BONUS RECEIVE BAND!

IC-T41A
UHF FM
Transceiver

Feel The Comfort Of Extended Operations With The IC-T21A!

Maximum Comfort

Elastomer Construction – This special material provides a comfortable, positive grip. The compact design fits the natural curve of your fingers and hand – especially welcome during long operating times.

Backlit Keypad – Ample spacing between keys for positive, error free operation.

Large Display – Indicates 17 different functions, battery capacity and subband frequency.

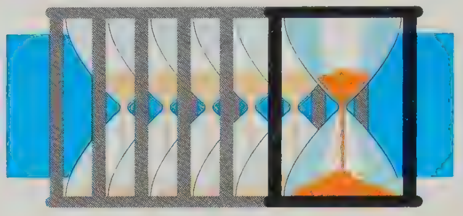
146.70 99
15.00
FM TRANSCEIVER
ICOM

Backlit Keypad!
With 4 selectable levels of contrast!

Full Crossband Duplex Operation

Dual Band Receive Capability – Permits reception of another band (i.e.: 440 MHz on the IC-T21A).

Full Crossband Duplex Operation – Possible with the unique "whisper mode" microphone (standard) for telephone type QSO's.



6 Hours Operating Time*

Low Power Consumption – Consumes only 8 mA while standing by.

Auto Power Control – Conserves the battery by monitoring the repeater signal strength and selecting the best matching output power from 5 levels (down to 15 mW).

Auto Low Power Function – Automatically selects 15 mW just before battery exhaustion so you can complete your QSO.

* 5.5 to 6 hours with 1:1:8 duty cycle (Tx high : RX : Standby)

Battery Capacity Indicator – Shows battery capacity.

New Scanning Standards

Ultra High Speed Scan – 3 to 4 times faster than most other handhelds (33 channels/sec., 12.5 memory ch./sec.).

Bonus Band – Can be scanned while the main band is being scanned (e.g.: 70 cm for the IC-T21A).

6 Priority Watch Modes – Check for other signals while operating on a VFO frequency.

Ultra-Convenient Repeater Operations

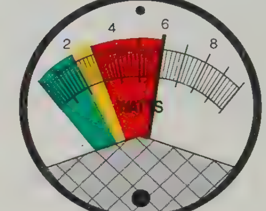
Subaudible Tone Scan – Detects, displays *and programs* the tone frequency into the VFO. Permits access to a repeater when you don't know the tone frequency.

Auto Repeater Function – Automatically activates repeater settings (duplex ON/OFF, duplex direction, tone encoder ON/OFF) when the operating frequency falls in the repeater output range.

Repeater Memory – Quickly recall settings of your last worked repeater (RPT-M key).

5 DTMF Memories – Automatically dial your favorite telephone numbers.

Selectable DTMF Transmission Speed – Adjust the IC-T21A/T41A to the capabilities of the repeater (5 cps, 2.5 cps, 1.6 cps, 1 cps).



Powerful 6 W Output Power*

Our newly designed SC-1257 power module provides all the power necessary to reach fringe areas. Accepts 4-16 V input.

* With a 13.5 V DC power source.

Innovative Memory Functions

114 Memory Channels – Store *all* repeater information.

Memory Select Channels – For quick access, up to 30 can be designated Memory Select Channels.

Memory Transfer – Quickly transfers a memory channel's contents to VFO. Useful for searching for signals near a memory channel.

EEPROM – Memory information is retained virtually forever.

And More!

- Includes Flexible Antenna, Belt Clip, Handstrap, Rechargeable Ni-Cd Battery Pack and Charger
- Built-in Pager, Code Squelch, Pocket Beep & Tone Squelch

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T21A1293Y

For more information call our brochure hotline: (206) 450-6088

Experience the Quality©

ICOM

With ICOM's New IC-281H . . . It's Not Just 2 M Anymore!

(2 M mobile transceiver *with* 440 MHz receive!)

BONUS RECEIVE BAND!

New Exciting Features!

Bonus Receive Band – The 430 (440) MHz bonus band is available for receive. Enables full duplex, crossband operation between the 2 M and 70 cm bands. Crossband repeat from 440 MHz to 2 M.

Scratch Pad Memories – 10 scratch pad memories automatically store your 10 previously transmitted frequencies (5 simplex and 5 duplex) for instant recall. No fumbling around trying to write down, or store into regular memories, frequencies which you want to use temporarily.

Memory Allocation Function – 60 regular memory channels can be divided between the main and bonus band. You can organize your memories for maximum efficiency and listening preference.

Automatic Memory Channel Advance – After a memory channel is programmed, the channel indicator automatically advances, speeding up the programming process.

Tone Scan* – Scans, detects *and sets* the subaudible tone. Permits access to a repeater when you don't know the tone frequency.

* Optional UT-85 required.

Voice Synthesizer* – The IC-281H announces the operating frequency, enabling quick confirmation without taking your eyes off the road. Very helpful for visually impaired operators, too.

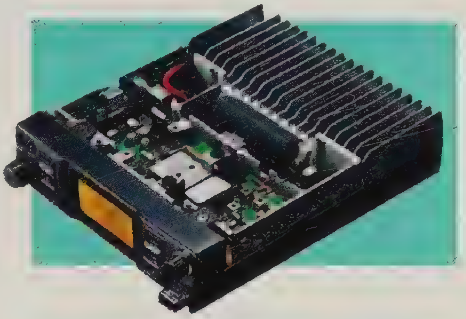
* Optional UT-66 required.

Packet "Plug and Play" Operation

Data Jack – Connects a TNC directly to the modulation circuit for packet conve-

9600 BPS Capability – No modifications necessary. Provides higher performance packet operations.

Modulation Circuit – Newly designed, prevents over modulation even during high data throughput.



Rugged, Durable Construction

Die Cast Aluminum Frame Construction – Meets the highest standards to provide reliability and long life. Will enhance your trade-in value years later.

Large Heat Sink – Dissipates the heat to maintain power output and stability characteristics.

Simple Operation

Remote Control Microphone – Puts the operation of several functions at your fingertips.

Auto Dialing Capability – Programs 14 telephone numbers for autodial via repeater autopatch.

"One Push" Action Switches – Eliminates the need for "two step" function switch operation. Simplifies mobile operations for convenience and safety.

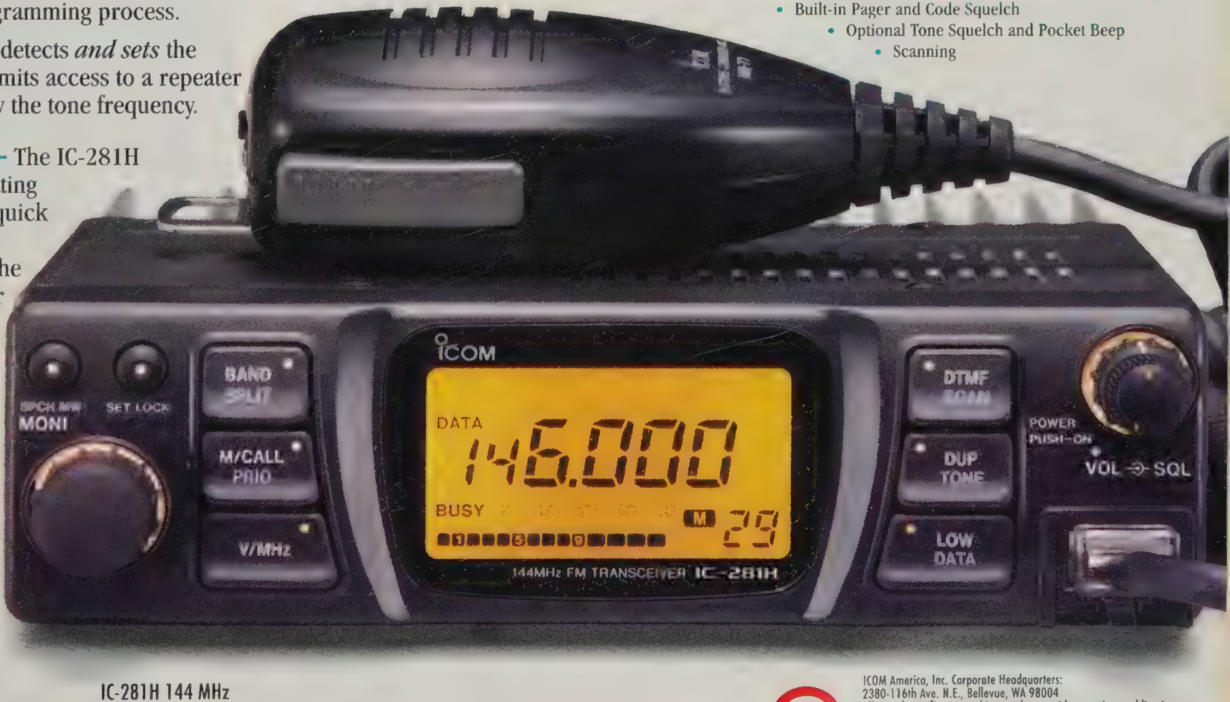
Large Display – Easy to see and logically organized for easy interpretation.

Auto Power Off – Shuts the transceiver down (when programmed). Great for bedside use.

Compatible Accessories – For easy mounting and operation.

And More!

- Built-in Pager and Code Squelch
- Optional Tone Squelch and Pocket Beep
- Scanning



IC-281H 144 MHz FM Transceiver

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For more information call our brochure hotline: (206) 450-6088

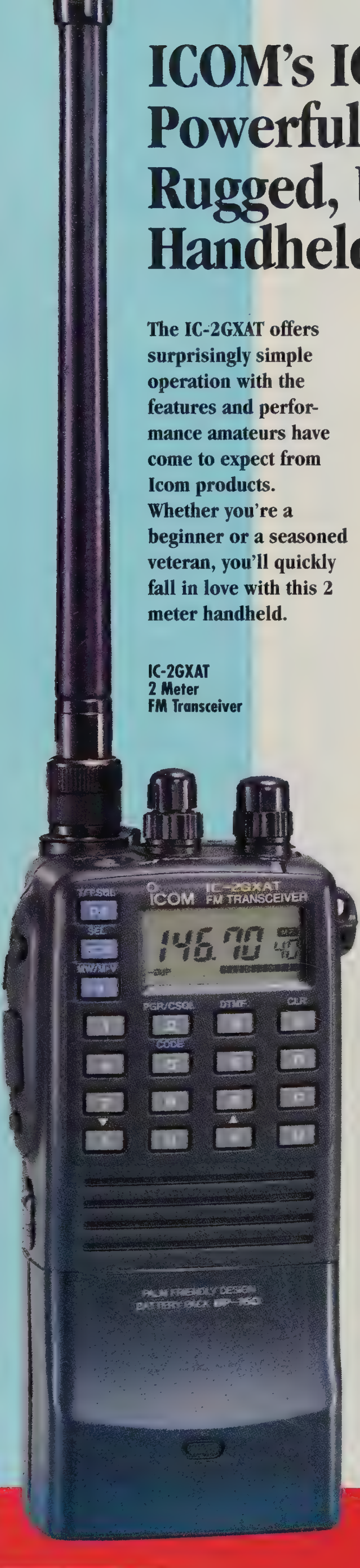
Experience the Quality

ICOM

ICOM's IC-2GXAT . . . Powerful Versatility In A Rugged, User-Friendly Handheld.

NEW

Limited Time Offer:
Special introductory pricing!
Call your dealer for details.


ICOM IC-2GXAT FM TRANSCEIVER
146.70
PALM FRIENDLY DESIGN BATTERY PACK BP-160

The IC-2GXAT offers surprisingly simple operation with the features and performance amateurs have come to expect from Icom products. Whether you're a beginner or a seasoned veteran, you'll quickly fall in love with this 2 meter handheld.

IC-2GXAT
2 Meter
FM Transceiver

SIMPLE OPERATION

Channel Operation – display can be set to indicate memory channel numbers only. This keeps frequencies secret, restricts operating frequencies or simplifies operation for an unfamiliar user.

Auto Repeater Operation – automatically activates the correct duplex direction when the receiver frequency tuned is within the repeater output frequency range.

Tone Scan – scans for, detects and sets the subaudible tone frequency to enable communication with another station that is using subaudible tones.

DTMF Redial– for quick and easy access to autopatches.

User Friendly Keyboard – uncluttered, user-friendly design for ease of operation.

ADVANCED FEATURES

Power Saver – reduces the current drain to 35 mA (avg. Rx) for battery conservation and extended operating time.

Low Power Option – switch to 1 W output power to extend your operating time when high power isn't required.

40 Memory Channels – store **all** repeater information independently.

Memory Transfer – the contents of a memory channel are transferred into VFO, **and the VFO mode is automatically selected,** to assure quick and easy QSY'ing.

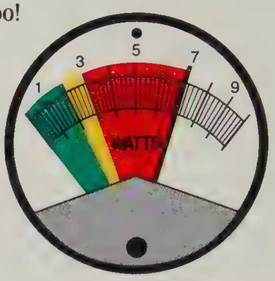
5 DTMF Auto Dial Memories – for quick and easy autopatching to frequently used telephone numbers.

Selectable DTMF Autodial Digit Duration – adjust your DTMF speed to the decode capabilities of the repeater.

Need more information?
Call our brochure hotline:
(206) 450-6088

MAXIMUM POWER

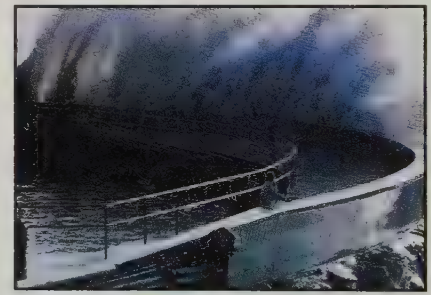
7 W Output Power – one of the highest powers available in a handheld (nominal with 13.5 V DC or the optional BP-132A battery pack). The BP-132A battery pack provides more than enough power to reach those fringe areas, and a long lasting 600 mAh too!



DURABLE CONSTRUCTION

Die-cast Aluminum Rear Case – will withstand the demands of rugged outdoor use.

Splash Resistant Body – maintains performance in harsh outdoor environments.



Rated JIS II for splash resistance, the IC-2GXAT is built to withstand rugged outdoor use.

OTHER GREAT FEATURES

- High Sensitivity: 0.18 µV for 12 dB SINAD
- Multiple Scan Modes
- Monitor Function
- SET mode to customize transceiver operation
- Display lighting with 5 second timer
- Subaudible tone encoder, tone squelch and pocket beep
- Optional pager and code squelch
- BP-160 (3 W, 700 mAh) battery pack, wall charger, belt clip and hand strap come standard
- 8 tuning steps (5, 10, 12.5, 15, 20, 25, 30 or 50 kHz)
- Call Channel
- Icom compatible accessories

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2GXAT1193Y

Experience the Quality ©

ICOM®

The IC-Δ100H Takes The Magic Beyond 3 Wishes!

Exclusive Triple Band Capability

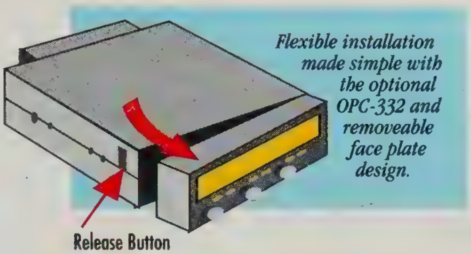
- Three independent band units for 2 M, 440 MHz and 1.2 GHz operation (simultaneous receive).
- Three independent displays can freely select the desired band unit.
- Each display indicates S/RF, volume and squelch levels.
- Each display is controlled by a separate volume and tuning knob.
- Select from 3 external speaker jacks.

8 POSSIBLE COMBINATIONS!

#1	#2	#3
2M	440MHZ	1.2GHZ
2M	440MHZ	440MHZ
2M	2M	1.2GHZ
2M	2M	440MHZ
440MHZ	440MHZ	1.2GHZ
440MHZ	440MHZ	440MHZ
440MHZ	2M	1.2GHZ
440MHZ	2M	440MHZ

More than a tri-band radio, the IC-Δ100H gives you true freedom of choice!

- No removal or installation of additional band units required.
- Each operating band has a separate antenna connector to enable duplexer/triplexer use without any mismatching antenna loss (not one common antenna for multi-signal, one band operation like you see in competitive models).
- Cross band double duplex (transmit on one band while receiving on two others) and full crossband duplex (transmit on one band and receive on another) is possible. The one-touch PTT enables telephone-like conversations without having to continually press PTT.



Flexible installation made simple with the optional OPC-332 and removeable face plate design.

Remote Installation Options

- **One Body** – install as a complete unit.
- **Separate** – detach the front panel and mount each separately (see illustration).
- **Remote** – Mount the main body in the trunk (OPC-333 and OPC-335 req.).

Incredible Performance

- AFC-RIT, AFC-VXO, manual RIT and manual VXO modes to compensate for "off frequency" of the Tx station (1.2 GHz).
- High Sensitivity – less than .16μV.
- Double-conversion superhetrodyne receiver system.
- More than 2.4 W audio output power.

Memory Bank System

- 642 memory channels organized in two separate banks* (very convenient for two ham families).

MEMORY BANK SYSTEM

Options	Bank/User #1			Bank/User #2			TOTAL
Bank	#1	#2	#3	#1	#2	#3	
Normal*	100	100	100	100	100	100	600
Scan Edge	6	6	6	6	6	6	36
Call	1	1	1	1	1	1	6
Total IC-Δ100H Memory Channels:							642

The memory bank system can even be customized for "his" and "hers" operation!

- Priority Watch – Scans one (or more) memory channels per band while operating on a VFO frequency.
- Transfer call or memory channel contents to VFO. Particularly useful when searching for signals around a memory channel frequency and for recalling the offset frequency, tone frequency, etc.
- 14 DTMF autodial memories for autopatching, accessing repeaters and controlling other equipment, etc.

* Stores operating frequency, duplex direction, offset frequency, subaudible tone frequency, encode on/off, tone squelch on/off and skip information.

Microphone Remote Controls

You Can Control *All* Of These Functions From The Microphone Keyboard!

- ☑ Power On/Off
- ☑ Select Main Band
- ☑ Change Operating Band
- ☑ Volume Adjust
- ☑ Squelch Adjust
- ☑ Mode Select
- ☑ Duplex Select
- ☑ Frequency Select
- ☑ Memory Channel Select
- ☑ Mute Bands
- ☑ Scan or Priority Watch
- ☑ Pager On/Off
- ☑ Code Squelch
- ☑ Tone, Tone Squelch
- ☑ Pocket Beep On/Off
- ☑ AFC On/Off
- ☑ Attenuator On/Off
- ☑ Set Mode
- ☑ DTMF Auto or Manual
- ☑ Operating Freq. Annce. (with opt. UT-66 synth.)
- ☑ Write VFO Contents to Memory or Call Channel
- ☑ Lock All Mic Keys or Keyboard Only

- A multi-function keyboard with complete control over the IC-Δ100H.
- The beep tones for each band are different and distinguishable so you can keep your eyes on the road.
- Over 22 functions are at your fingertips with the IC-Δ100's unique microphone keyboard (see chart above)!

IC-Δ100H
ICOM
MAIN
DUP-
146.500
447.000
1292.100
LOW
99
V/MHz M/CALL SQL
PRIO M.SQL

IC-Δ100H
Triple Band Mobile
Transceiver
(shown with the optional OPC-332)

Other Great Features

- External remote control via another transceiver (UT-55 required)
- Tri, dual or mono band operation
- Sub band access/mute/busy beep functions
- Optional pocket beep and tone squelch
- Opt. pager/code squelch
- Tone encoder built in
- Multiple scans

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ICOM®

Kenwood's TH-22AT/42AT: The Compact Solution!

144 MHz/450 MHz single band HTs

More Power !

KENWOOD
KENWOOD

Features

- 3-watt output from MOS FET power module and supplied 6-volt battery (TH-22AT: approx. 3 watts, TH-42AT: approx. 2.5 watts), and 5-watt output with optional PB-34!
- Compact design: 2-3/16 x 4-5/8 x 1 in.
- Built-in DTMF keypad with monitor
- Built-in DTSS page system
- Large 1-7/16" speaker
- 41 E^{2}PROM channel memories (including 1 call channel)
- Multiple scan functions (VFO, call & memory)
- Carrier-operated & time-operated scan stop modes
- Tone alert with elapsed time indicator
- Battery-saver circuit and auto power-off function to extend battery life
- Selectable squelch configuration
- RF output power control (Hi/Low/EL)
- Built-in CTCSS encoder, optional TSU-8 decoder (any tone can be stored in any channel)
- User-friendly menu system to customize your operating preferences
- Easy to program and use
- Modifiable for MARS and CAP. Specifications guaranteed for Amateur bands only. Permits required for MARS and CAP use.
- Wide range of accessories to enhance operating convenience and enjoyment

Slim, compact, lightweight. These words describe the exterior of the new TH-22AT Series HTs. Rugged, innovative, sturdy. These words describe what is on the inside. Because along with the beauty, this new series of HT has all the things you want in a portable communications package. Like a streamlined, easy to program interface, one touch controls, and a simplified menu of functions that you can customize to suit your needs. Even a DTMF memory that stores five of your favorite 15-digit telephone numbers for autopatch use. Wide band receive - 136 to 173.99 MHz. A new innovative microprocessor and final amplifier circuit enables a full five watts, while conserving battery power. (The supplied battery provides **3 watts**.) Easy mobile operation with optional PG-3H cable.

As always, a full line of accessories is available to enhance your operating enjoyment!

See your favorite Authorized Kenwood Amateur Radio Dealer for all the details!

Modifiable for MARS/CAP use.
Permits required. Specifications
guaranteed for Amateur band only.

93ARD-0829

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6070 Kestrel Road, Mississauga, Ontario L5T 1S8

KENWOOD

You Asked for It, And Kenwood Delivers !

Very popular with NO CODE TECHNICIANS !

KENWOOD
50MHz ALL MODE TRANSCEIVER TS-60
HF TRANSCEIVER TS-50

NEW TS-60S:
Super Compact, 90W, 6 meter Transceiver

TS-50S:
Super Compact 100W, HF Transceiver

Features

- 100W (TS-50S), 90W (TS-60S) on SSB, CW, FM modes, 25W on AM mode
- 100 memory channels
- CTCSS encode built-in
- DDS(Direct Digital Synthesizer) with fuzzy logic control
- Large LCD panel with digital bar meter
- Auto-mode capability
- Menu system selects custom operating features
- AIP (Advanced Intercept Point) for increased receiver dynamic range
- Switchable AGC Circuit (SLOW/FAST)
- All-mode squelch
- CW reverse mode
- Full break-in and semi break-in
- 20dB attenuator
- Relay & ext. ALC terminals
- Multi-function microphone supplied
- Auto power off function
- 3-position RF output power control
- Optional 500Hz CW filter (YK-107C)
- Optional AT-50 external antenna tuner (TS-50S only)
- Optional computer interface (IF-10D)

Meet the new set of twins from Kenwood -- The TS-60S all mode, 6 meter, 90W transceiver, and the TS-50S all band, 100W HF transceiver with general coverage receiver. Due to the amazing response to our super compact TS-50S transceiver, we have come up with a companion 6 meter transceiver in the same package, the TS-60S. Compact enough to mount in a vehicle or take into the field, both models provide desktop power and such sophisticated features as 100 memory channels, microprocessor controlled Direct Digital Synthesis (DDS) with innovative "fuzzy logic" control, and Kenwood's own AIP for superior dynamic range. There's also IF shift and CW reverse mode for interference reduction, TF-SET, and a noise blanker - plus everything you need for split - frequency operations. The menu function enables you to customize and select operating features to suit your individual needs.

TS-50S and TS-60S -- the new set of twins from Kenwood. Innovative, rugged, super compact - choose one for your shack, mobile, or portable operations today!

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KENWOOD

Kenwood's TM-942A/742A/642A—

Triple Triumph

NEW
TM-642A
TM-942A
TM-742A
TM-942A/742A/642A
FM MULTIBANDER

Good things come in threes. Like Kenwood's distinctive TM-942A (144MHz/440MHz/1200MHz), TM-742A (144MHz/440MHz), and new TM-642A (144MHz/220MHz)—high-performance FM multibanders that demonstrate the best in mobile communications technology. Besides offering triple receive and display capability, the TM-942A can even receive all three bands simultaneously. For the TM-742A and TM-642A, you can choose one of several optional band units, enabling triple band operation with the same triple simultaneous receive. Top-notch features include 101 memory channels (all available for split operation), automatic band change, DTSS with page, and S-meter squelch. There's even a wireless remote control function. Yet operation is remarkably simple, thanks to sophisticated microprocessor control, high-visibility illuminated keys, and clear status displays. You wouldn't expect any less from Kenwood. But there's more: you can mount the controls and display separately from the main unit (requires optional kit) for unique 3-way convenience.

Features

- Max. 50W output (144MHz), 25W (220MHz), 35W (440MHz), 10W (1200MHz)
- 101 memory channels & memory bank system
- Independent SQL & VOL controls for each band
- Automatic band change
- Built-in DTSS selective calling feature with page
- Selectable frequency step
- 8 scan modes per band
- Time Operated & Carrier Operated scan stop modes
- Direct frequency entry with supplied microphone
- Tone alert with elapsed time indicator
- S-meter squelch, noise squelch & auto squelch
- Cross-band repeater
- Muting for sub-band circuit
- Multiple lock functions
- Wireless remote control function
- Built-in CTCSS encoder & optional TSU-7 decoder
- Date & time display, stopwatch, alarm & on/off timer
- 3-position RF output power control
- Auto power-off with warning beeper
- Time-out timer
- Separate control & display units (optional cable kits)

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KENWOOD

94ARD-0894

Kenwood's TM-251A/451A/551A

Shift into Overdrive!

KENWOOD
MR
VFO
MENU
PWR
+U
146.970
448525
DUP
CO
APO
S.SQL
BUSY
TOT
VOL
SQL
LOW
LOCK
T. ALT
SEL
BAND
SEL
SHIFT
TONE
CTCSS
DTSS

TM-251A

TM-251A/451A/551A

FM MOBILE TRANSCEIVERS

1200
9600 bps
packet compatible

When the going gets rough, Kenwood's mobile FM transceivers show their stuff. For a winning combination of performance and operating ease, nothing beats the TM-251A (144MHz), TM-451A (440MHz), and TM-551A (1200MHz). Despite being single-banders, they have a dual-band receive capability, allowing full-duplex cross-band communications using split-memory channels (TM-251A↔TM-451A). Each transceiver is equipped with 41 memory channels (expandable to 200 with the ME-1 option), a digital recording system for messages (max. 16 secs), a dual-menu system, and a 6-pin mini DIN connector for 1200/9600bps packet communications. Built-in DTSS allows 3-digit DTMF selective calling access, and the page function alerts you to incoming calls. There's also a large multi-function LCD with 3 different display modes, as well as a multi-function microphone with 4 programmable keys and 16 DTMF keys. So if you want pole position, choose Kenwood.

TM-451A

Available soon!

TM-551A*

*This device has not been approved by the Federal Communications Commission. This device is not, and may not be, offered for sale or lease, or sold or leased until the approval of the FCC has been obtained.

Features

- Max. 50W output (TM-251A), 35W (TM-451A), 10W (TM-551A)
- 41 memory channels (up to 200 with ME-1 option)
- Dual-menu system
- DTSS with page
- S-meter squelch
- Built-in digital recording system
- 6-pin mini DIN connector (1200/9600bps packet)
- Multi-function microphone with DTMF (supplied)
- Fuzzy logic control for tuning
- Selectable frequency step (5, 10, 12.5, 15, 20 or 25kHz)
- Channel number display
- Auto-lock tuning (TM-551A)
- Band scan, program scan, memory scan, call scan
- Time Operated and Carrier Operated scan stop modes
- Cross-band repeater functions
  TM-251A — TX: 144MHz band, RX: 440MHz band
  TM-451A — TX: 440MHz band, RX: 144MHz band
- Auto repeater offset (TM-251A)
- 10 DTMF memory (15 digits)
- Built-in CTCSS encoder and optional TSU-8 decoder
- 5-step dimmer control
- 3-position RF output power control (TM-251A: 50W, 10W, 5W, TM-451A: 35W, 10W, 5W)
- Auto power-off (OFF, 60, 120, 180 min.)
- Time-out timer (OFF, 3, 5, 10, 20, 30 min.)
- Wireless clone function

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KENWOOD

94ARD-0895

Kenwood's TM-733A –

Faster and Faster!

KENWOOD
146.970
30
448.525
40
CALL
LOW
SHIFT
TONE
REV
MUTE
CO
APO
TOT
PWR
VOL
SQL

TM-733A

FM DUAL BANDER

1200/9600bps packet compatible

Theft Deterrent

Features

- Max. 50W output (144MHz), 35W (440MHz)
- "6-in-1" programmable memory
- 72 memory channels
- Time-Operated & Carrier-Operated scan stop modes
- Dual receive on same band (VHF+VHF or UHF+UHF)
- Built-in DTSS selective calling with page
- ASC (Auto Simplex Checker)
- Built-in CTCSS encoder & optional TSU-8 decoder
- Key function display
- Automatic band change
- AIP (Advanced Intercept Point)
- Cross-band repeater
- Selectable frequency step (5, 10, 12.5, 15, 20 or 25kHz)
- Wireless clone function
- Incremental MHz key
- S-meter squelch
- Tone alert system with elapsed time indicator
- Separate speaker terminals for each band (switchable)
- Auto repeater offset (144MHz)
- Repeater reverse switch & offset switch
- 3-position RF output power control
- Dimmer control
- Auto power-off

Kenwood's new FM dual bander, the TM-733A (144MHz/440MHz), is specially tailored for hassle-free mobile communications with a unique "6-in-1" programmable memory. Six entire operating profiles—including everything from frequency range to dimmer level—can be stored, ready for instant recall. So there's virtually no need to adjust your settings. The detachable front panel has a high-visibility LCD with key function display to make on-the-move operation even easier. Of course, this compact transceiver has a full complement of sophisticated features, including 72 memory channels, DTSS selective calling and page functions, ASC (checks whether you can switch from a repeater to simplex communications), AIP (Kenwood's exclusive circuit for enhancing RX performance), and a jack for 1200/9600bps packet use. And as well as receiving simultaneously on VHF and UHF bands, the TM-733A can receive two frequencies on the same band (VHF+VHF or UHF+UHF). There's even an optional quick-release kit as an added anti-theft measure. So check out the TM-733A-a sensation bred from inspiration.

*This device has not been approved by the Federal Communications Commission. This device is not, and may not be, offered for sale or lease, or sold or leased until the approval of the FCC has been obtained.

*An optional accessory kit is required to mount the front panel separately from the main unit.

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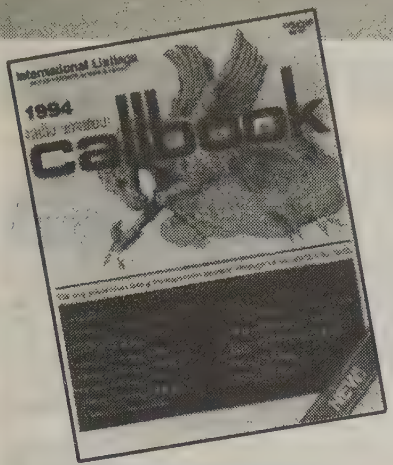
94ARD-0893



CALLBOOK

USCB	North American Callbook
DXCB	International Callbook
SUPPLEMENT	Callbook Supplement-US & DX

ARRL

ARRL LICENSE PREPRATION

10-15ARRL	10-15 WPM Code Tape
13-14ARRL	13-14 WPM Code Tape
15-22ARRL	15-22 WPM Code Tape
5-10 ARRL	5-10 WPM Code Tape
NYT II	Study Guide for the No-Code Technician License
LM-TECHNICIAN	Technician Class Manual
LM-GENERAL	General Class Manual
LM-ADVANCED	Advanced Class Manual
LM-EXTRA	Extra Class Manual
TFRB	FCC Rule Book
YITMC	Introduction to Morse Code

ARRL TECHNICAL BOOKS

AIM	Antenna Impedance Matching
DB	Data Book
DN	W1FB Design Notebook
FSIR	First Steps in Radio
HK	Hints and Kinks
LBD	Low Band DXing
MEM	Microwave Experimenter Manual
NAN	Novice Antenna Notebook
OM	Operating Manual
PDOYA	Yagi Design
QRP	QRP Classics
REFLECTIONS	SWR Theory
RFI	Radio Frequency Interference
RSGB-AWARDS	Awards Book
RSGB-OP MAN	Amateur Radio Operating Manual
RSGB-RCH	Radio Communication Handbook
RSGB-VHF	VHF / UHF Handbook
SA	Satellite Anthology
SEH	Satellite Experimenters Handbook
SSD	Solid State Design
SSS	Spread Spectrum Source Book
TFRB	The FCC Rule Book
TLT	Transmission Line Transformers
TRAH	ARRL Hardcover Handbook
OARS	Operating an Amateur Radio Station
WSH	Weather Satellite Handbook

ARRL LISTINGS

DXCC LIST	Official ARRL DXCC List
LB	Log Book
ND	Net Directory
RD	Repeater Directory

ARRL PACKET BOOKS

GTPR	Gateway to Packet Radio

ARRL ANTENNA BOOKS

AB	Antenna Book
AC	Antenna Compendium
AN	W1FB Antenna Notebook
NAN	Novice Antenna Notebook
RSGB-ANT	H.F. Antenna Book
RSGB-WIRE	Wire Antennas
YAD	Yagi Antenna Design

ARRL MAPS

GRID ATLAS	Grid Locator Atlas
GRID MAP	Grid Locator Map
USCAM	U.S. Call Area Map
WM	World Map

ARRL READING

CQGS	CQ Ghost Ship
DVQTH	Death Valley QTH
DXBD	DX Brings Danger
DXCC COMPANION	DX Guidebook
FSTS	From Spark to Space
GCQ	Grand Canyon QSO Book
GIL	Cartoon Book
HFNH	Help for New Hams
MBQ	Murder by QRM
MORSE CODE	The Essential Language
NCJ	Bi-Monthly National Contest Magazine
NS	Night Signals
NN	Novice Notes
QRP NOTE	QRP Notebook
QST	Monthly Magazine of ARRL
RADIOGRAM	Radiogram Message Forms
SOSAM	SOS at Midnight
YVC	Your VHF Companion

CRB

ROUSGRF	Registry of Government Freq's

SWL

1487	SWL Antenna Handbook
MT	Monitoring Times Monthly
PASSPORT	Passport to World Radio
WRTVH	World Radio TV Handbook

SCANNER BOOKS

HRO stocks a number of scanner books for various geographical areas. These publications contain the frequencies for the areas that can be heard on the scanner. Contact your nearest HRO store for details.

UNIVERSAL

RTTY CALL	RTTY Call Signs
RTTY TODAY	Complete Guide to Amateur RTTY
SFFG	SW Facsimile Freq Guide
WPSF	World Press Services Frequency Book

ARTSCI

ALPHA&ZULU	Ride the Airwave withAlpha & Zulu
AMAT HB	Amateur Handbook
FA	Federal Frequency Book
LUM	Lost Users Manual
NASFG	Shortwave Guide
RTM	Guide to Radio Mods

HOW TO ORDER BOOKS

The books listed show
an HRO order code followed by a title.
Please provide the code
when you are placing your order.

RADIO PUBLICATIONS

ANTENNA HB	Antenna Handbook
BEAM	Beam Antenna Handbook
INTERFERENCE	Interference Handbook
QUAD	All About Cubical Quads
SHORTWAVE	Better Shortwave Reception
VERTICAL	All About Vertical Antennas
VHF	All About VHF Amateur Radio
WIRE	Low-Cost Wire Antennas
COMPLETE DX	Complete DX'er by W9KNI

MAGAZINES

73	73 Monthly Magazine
Antenna	Antenna Buyers Guide
CQ	CQ Monthly Magazine
BG	Equipment Buyers Guide
Popular	Popular Communications
QST	QST Monthly Magazine
MT	Monitoring Times
WRN	World Radio News

Study Aids

AMECO

100-T	Junior Code Tape
101-T	Senior Code Tape
102-01	Amateur Radio Theory Course
103-T	Advanced Code Tape
104-T	Extra Class Code Tape
105-QT	General Class QSO Course Tape
105-QT	Extra Class QSO Course Tape
12-01	General Class Test Manual
17-01	Extra Class Test Manual
26-01	Advanced FCC Test Manual
27-01	Novice FCC Test Manual
28-01	Technician Class Test Manual
EN-1	Novice Class Exam
78-01	Codeless Technician Manual

GORDON WEST

GW0064	Ground Foil 25'
GW0065	Ground Foil 50'

KB6MT

CODE	Novice to 21 WPM Code Training Tapes
IT	Instant Theory Tape
IT-NCTECH	Instant Theory No Code Tech
IT-NOVICE	Instant Theory Novice
IT-TECH	Instant Theory Tech
IT-GEN	Instant Theory General
IT-ADV	Instant Theory Advanced
IT-EXTRA	Instant Theory Extra
WORDS	Code word course

W5YI

HRH	Ham Radio Handbook Study Guide for the No-Code License
W5YI-HO	Study Course, all Licenses (PC)
ADV	Advanced Manual by Gordon West
GWEM	General Class

QRZ! Ham Radio CDROM

Announcing the New QRZ! Ham Radio CRROM for DOS and Windows. This is the perfect information source for Hams and SW Listeners. For more details see page 78.

Software is sold on a non-returnable basis. Any software problems will be resolved under the terms of the manufacturer's warranty.

MFJ

HF Tuners

16010
901B
945D
941E
948
949E
962C
986
989C

MFJ-16010 Random Wire Tuner for all bands anywhere. 1.8-30 MHz. Turn any random wire into a transmitting antenna. Also for apartment, motel, camping. 200 watts. *HRO Price $39.94*

MFJ-901B Versa Tuner is our smallest, most affordable 200 watt tuner. Good for matching solid state rigs to linears when space and budget are limited. 1.8-30 MHz, 4:1 balun. *HRO Price $59.95*

MFJ-945D Mobile Tuner Take along this mobile tuner and have an uninterrupted trip. It extends antenna bandwidth and eliminates the need to stop, go outside and readjust your mobile whip. Cross-needle meter allows hands-free operation. Handles 300 watts. It reads forward/reflected power in 50/300 and 5/50 watt ranges. Has on/off lamp switch. Efficient air wound inductor gives you lower losses and more watts out. 1000 volt capacitors. Covers 1.8-30 MHz. *HRO Price $89.95*

MFJ-941E Versa Tuner II A 300 watt antenna tuner covers 1.8-30 MHz, and you get a lighted cross-needle meter with on/off switch. (Light uses 12 VDC or optional 100 VAC MFJ-1312.) Antenna switch and 4:1 balun. *HRO Price $99.95*

MFJ-948 like the 949E but without dummy load. Eggshell white. *HRO Price $119.95*

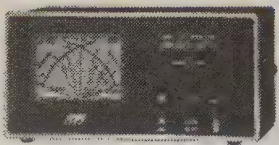
MFJ-949E Deluxe Versa Tuner II covers 1.8-30 MHz and handles 300 watts. Has built-in 50 ohm dummy load. Lighted peak reading cross-needle SWR/wattmeter. Reads forward/reflected power in 50/300 and 5/30 watt ranges. Front panel antenna switch selects 2 coax lines direct or through tuner, random wire/balanced line or dummy load. Efficient 12 position airwound inductor gives lower losses and more power out. Has 4:1 balun, 1000 volt capacitors. A black aluminum front panel matches your rig perfectly. *HRO Price $139.95*

MFJ-962C Versa Tuner III for 1.8-30 MHz handles 1.5 kW PEP. Matches coax, random wire, or balanced line (built-in 4:1 balun). Six position antenna switch for 2 coax lines. *HRO Price $219.95*

MFJ-986 Differential-T Tuner™ for 1.8-30 MHz, at 2 kW PEP. T-network with roller inductor and differential capacitor. Peak reading cross-needle SWR/wattmeter for 200/50 and 2000/500 watt ranges. Roller inductor spinner knob, 3 digit counter. 6 position antenna switch. 4:1 balun. *HRO Price $279.95*

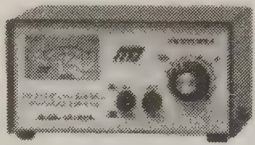
MFJ-989C Versa Tuner V heavy duty! Covers 1.8-30 MHz, 3 kW PEP, matches everything: coax fed, random wires and balanced lines. Roller inductor with spinner knob and 3-digit counter. Peak reading Cross-needle SWR/wattmeter 200/2000 watt ranges. 50 ohm, 300 watt dummy load, 4:1 balun, 6 position antenna switch, tilt flip stand. *HRO Price $329.95*

MFJ Wattmeters

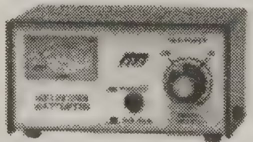


MFJ-815B Deluxe Peak Reading SWR / Wattmeter covers 1.8-60 MHz. Illuminated cross-needle meter shows peak or average forward/reflected power and SWR at a glance. Two ranges: 200/2000 watts. Meter light requires 12 VDC. *HRO Price $69.95*

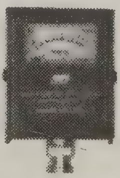
MFJ-817 144 and 440 MHz SWR / Wattmeter shows peak or average forward and reflected power and SWR at a glance. Two power ranges (200/20 forward and 50/5 reflected). Push button to select range, meter lamp, and peak or average power. Lamp uses 12 VDC or option 100 VAC MFJ-1312. *HRO Price $79.95*



MFJ-812B VHF SWR / Wattmeter for 2 meters and 220 MHz. Reads SWR forward and reflected power on 30 and 300 watt scales; SWR from 14 MHz through 220 MHz and relative field strength from 1 to 220 MHz. *HRO Price $29.95*

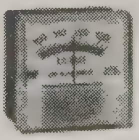


MFJ-816 HF SWR/Wattmeter similar to the MFJ-812B but covers 1.8-30 MHz. Reads forward/reflected power on 30 and 300 watt scales and SWR (no field strength). *HRO Price $29.95*



MFJ-840 2 Meter Handheld Power Meter For 2 meter handhelds and QRP. 1.8-148 MHz. Has built-in 50 ohm load. Reads 5 watts full scale. BNC Connector. *HRO Price $19.95*

MFJ-841 2 Meter Handheld SWR / Wattmeter connects directly in-line with 2 meter handhelds and antenna. Reads SWR up to 6:1 and power output to 5 watts. BNC connectors. *HRO Price $39.95*



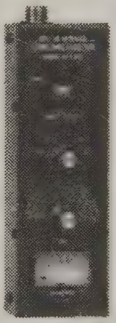
MFJ-850 AC Line Monitor guards against low voltage "brown out," electrical surges. Leave plugged in for constant monitoring. One year guarantee, 2% accuracy. *HRO Price $19.95*

MFJ SWR Analyzers

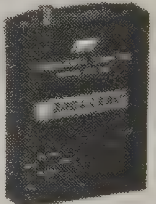
MFJ-249 SWR Analyzer covers 1.8-170 MHz continuously. Built-in 10 digit LCD frequency counter. Ball-bearing vernier reduction drive on tuning capacitor makes it easy to set frequency precisely. Reading SWR is automatic. Plug in your antenna, set your SWR analyzer to the frequency, and read the SWR. Three instruments in one: RF signal generator, a 170 MHz frequency counter, and an SWR Analyzer. Handheld size. Operate with batteries or with optional AC adapter MFJ-1312B. *HRO Price $189.95*

MFJ-209 like the MFJ-249 less the frequency counter. Has frequency output. *HRO Price $109.95*

MFJ-203 Bandswitched Dip Meter covers 1.8-30 MHz. Use it to determine resonant frequency of tuned circuits and antennas. Measure Q of coils or use it as a signal generator. Comes with a detachable coupling coil and has a frequency counter jack for precise frequency setting. Use 9 V battery or 110 VAC with optional MFJ-1312B. *HRO Price $99.95*



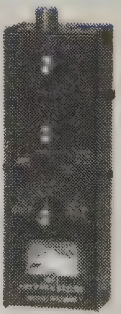
MFJ-205 Antenna Resistance Meter Find your antenna's feedpoint resistance at its resonant frequency. Has a frequency counter jack for precise frequency setting. Use 9 V battery or 110 VAC with optional MFJ-1312B. *HRO Price $89.95*



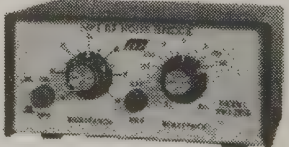
MFJ-259 HF / VHF SWR Analyzer The MFJ-259 has all the features of the MFJ-249 plus the exclusive MFJ RF Resistance Meter. You can now measure RF feedpoint resistance up to 500 ohms at minimum SWR instantly on the MFJ exclusive side-by-side RF Resistance Meter™ and SWR meter. Take the guesswork out of building matching networks and baluns. *HRO Price $209.95*

MFJ-29 Carrying Pouch *$19.95*
MFJ 219 440 MHz UHF SWR Analyzer *$89.95*

MFJ Antenna Bridges

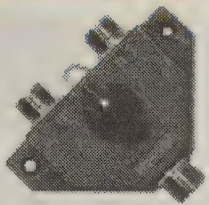


MFJ-204B Antenna Bridge measures resonant frequency and antenna resistance to 500 ohms. Built-in resistance bridge, null meter, tunable oscillator driver. 1.8-30 MHz. 9 V battery or 110 VAC with optional MFJ-1312. *HRO Price $79.95*



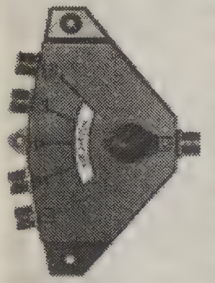
MFJ-202B RX Noise Bridge measures resonant frequency, feedpoint resistance and reactance. Works with receivers or transceivers. Hand calibrated resistance scale, capacitance range (150 pf), built-in range extender. *HRO Price $59.95*

Antenna Switches



MFJ-1702B Coax Antenna Switch. 2 positions plus center ground, 50 ohm. Rated to 500 MHz with 02 dB loss. Handles 2.5 kW PEP or 1 kW CW. 60 dB isolation at 300 MHz. 50 dB isolation at 450 MHz. Unused terminal grounds for static protection. *HRO Price $21.95*

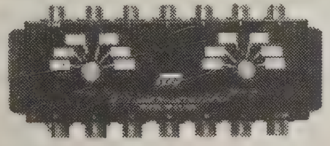
MFJ-1702BN has Type N connectors, goes to 1.1 GHz. *HRO Price $31.95*



MFJ-1704 Coax Switch 4 positions plus center ground, 50 ohm. Rated to 500 MHz with 0.2 dB loss. Handles 2.5 kW PEP, 1 kW CW, 50 dB isolation at 500 MHz. Includes a replaceable lightning protection device that reduces lightning surges and static. *HRO Price $59.95*

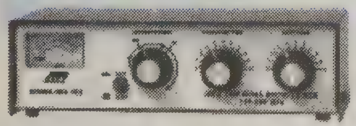
MFJ-1704N has Type N connectors. *HRO Price $69.95*

MFJ-1701 Antenna Switch 6 positions, 50-75 ohm. Handles 2 kW PEP or 1 kW CW. 1.8-30 MHz. SO-239 connectors. Unused positions grounded. *HRO Price $34.95*



MFJ-1700B Antenna / Transceiver Switch 1-6 antennas, 1-6 rigs. Tuner, SWR meter, linear etc. in line to operate any combination. 50-75 ohms. Handles 2 kW PEP or 1 kW CW. 1.8-30 MHz. SO-239 connectors. Unused positions grounded. *HRO Price $64.95*

VHF / UHF Tuners



MFJ-921 Dual Band VHF Tuner covers 2 meters and 220 MHz. Convenient built-in VHF SWR/wattmeter. Handles 200 watts and matches a wide range of impedances. It is excellent for mobile and base operation. SO-239 input/output connectors and wing nut post for your ground. Eggshell white and black aluminum cabinet. Comes with MFJ's full one year unconditional guarantee. *HRO Price $69.95*
MFJ-924 similar to the MFJ-921 but covers only the 440 MHz band. *HRO Price $69.95*

Call HRO Toll Free

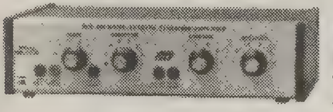
MFJ SWL Products

MFJ-1214PC Multimode transmits and receives WeFAX, FAX, CW, RTTY, and ASCII. Use your computer and radio to receive, display and transmit brilliant full color news photos and incredible WeFAX weather maps with all 16 gray levels. Easy-to-use menu-driven software, cables, power supply, comprehensive manual and Jump-Start™ guide. Works with VGA, EGA or Hercules IBM compatibles with 512k RAM and 8 MHz or faster speeds.
HRO Price $139.95

MFJ-1020A Indoor Active SWL Antenna. Tuned circuit minimizes intermod, improves selectivity, reduces noise outside the tuned band. Use as preselector with external antenna. 0.3 to 30 MHz. Tune, Band, Gain, ON-OFF/Bypass Controls. Telescoping whip. Use 9 V battery (not included), 9-18 VDC or 110 VAC with optional MFJ-1312. *HRO Price $79.95*

MFJ-1022 300 kHz to 200 MHz Active Antenna. Uses new noiseless feedback circuit to give you excellent low noise reception. Uses 9 V battery or 110 VAC with optional MFJ-1312B. *HRO Price $39.95*

MFJ-1024 54" Outdoor Active Antenna covers 50 kHz to 30 MHz. Receives strong, clear signals, 20 dB attenuator, gain control, ON LED. Switch selects from two receivers and two antennas. Remote unit has 54 inch whip, 50 feet of coax and connector. 12 VDC or 110 VAC with optional MFJ-1312.
HRO Price $119.95



MFJ-959B Receiver Antenna Tuner / Preamplifier provides proper impedance matching so you transfer maximum signal from antenna to receiver. Covers 1.6 to 30 MHz, 20 dB preamp with gain control boosts weak stations. 20 dB attenuator prevents overload. Select from 2 antennas, 2 receivers. Uses 9-18 VDC or 110 VAC with optional MFJ-1312. *HRO Price $89.95*

MFJ-956 LW / MW / SW Preselector / Tuner Boost your favorite stations while rejecting images, intermod and other phantom signals. It greatly improves reception of signals from .15 to 30 MHz. Connects between receiver and antenna. Has tuner bypass and ground receiver positions. *HRO Price $39.95*

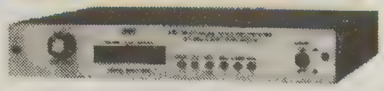
MFJ-1040B All Band Transceiver / Preselector lets you copy weak signals. Rejects out-of-band signals, images. 1.8-54 MHz. Up to 20 dB gain. Dual gate MOSFET, bipolar transistors for low noise, high gain. 20 dB attenuator, 2 antennas, 2 receivers. Coax and phone jacks. Bypass to 350 watts. Jack for PTT. Uses 9-18 VDC or 110 VAC with optional MFJ-1312. *HRO Price $99.95*

MFJ Clocks

MFJ-108B / 107B 12/24 Hour Clocks Huge 5/8 inch bold LCD digits lets you see the time from anywhere in your shack. Choose from the dual clock that has UTC and local display or the single 24 hour clock. Mounted in brushed aluminum frame. Easy set.
HRO Prices MFJ-108B $19.95 MFJ-107B $9.95

MFJ-112 DXer's World Map Clock. Push-buttons let you move east and west on the map display to the time at any QTH throughout the world. Time display hour/minute/second. Also displays week, month, year and day of the week. User selectable for 12 or 24 hour display format. *HRO Price $24.95*

Packet / Multimode



MFJ-1278B With PACTOR built-in, the MFJ-1278B brings you all 9 digital modes and state-of-the-art advances. Now with full Color SSTV, Color FAX and 16 Gray Levels Modem—the latest MFJ breakthrough—Packet, AMTOR, RTTY, ASCII, CW, FAX, SSTV, Navtex and Contest Memory Keyer. Plus 32k RAM, mailbox expandable to 128k or 512k, free AC power supply. Host Mode, KISS interface for TCP/IP and MSYS compatibility, fast through-put anti-collision technology. Independent transmit level for each radio port, random code generator, lithium battery backup, RS-232 and TTL, serial ports, socketed IC's, tune-up command, peripheral I/O port, automatic serial numbering, programmable message memories, dual radio ports (each HF or VHF), CW paddle jack. Audio amplifier and speaker jacks to monitor CW sidetone. Transmit and receive audio and packet connect bell. New fully integrated instruction manual with Fast-Start™ booklet. 1 year No Matter What™ guarantee. *Suggested List Price $299.95*
MFT-1278BT Turbo like the 1278 but with the fast 2400 baud packet. *Suggested List $369.95*

MFJ-1274C Super TAPR Clone known worldwide as the most reliable TNC. Thousands are used as digipeaters, nodes, BBS--many in 24 hours per day applications for years without a failure. VHF and HF use. Free AC power supply. WeFAX gives weather map, mailbox expandable to 128k. Easy upgrade to 2400 or 9600 baud. Host Mode, KISS interface. 1 year No Matter What™ guarantee. Uses 12 VDC or 110 VAC. *HRO Price $139.95*
MFJ-1270C same as MFJ-1274 without the 20 LED tuning indicator. *HRO Price $119.95*
MFJ-1274CT has built-in 2400 baud modem. *HRO Price $209.95*
MFJ-1270CT has built-in 2400 baud modem. *HRO Price $199.95*

MFJ-1214PC Multimode lets you transmit and receive FAX, WeFAX, RTTY, ASCII and CW. Use your computer and radio to receive, display and transmit brilliant full color news photos and incredible WeFAX weather maps with all 16 gray levels. Easy-to-use menu driven software, cables, power supply, comprehensive manual and Jump-Start™ guide. Works with VGA, EGA or Hercules IBM compatibles with 512k RAM and 8 MHz or faster speeds. *HRO Price $139.95*

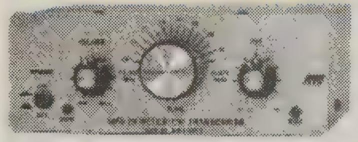
MFJ-2400 baud modem for MFJ-1278 and TNC. *HRO Price $89.95*
MFJ-9600 baud G3RUH compatible modem for MFJ-1278 and TNC. *HRO Price $99.95*

MFJ-1292 "Picture Perfect" video digitizer is perfect for you MFJ Multimode or TNC. Converts VGA packet, SSTV or FAX picture. Use your video camera or camcorder. *HRO Price $189.95*

MFJ Packet Software

MFJ-1289 Multicom™ Exciting new 1278 software, bursting with features for IBM and compatibles: Gray level FAX, SSTV, color VGA Packet Picture, One-key Macros™, Call-Alert™, Auto-set™, Auto-router™, Packet Multi-plex™, Multi-word™. RS-232 cable. *HRO Price $59.95*
MFJ-1282B Starter Pack for C64/128 MultiCom64™. *HRO Price $39.95*
MFJ-1287B Starter Pack for Macintosh MultiCom-Mac™. *HRO Price $24.95*

Transceivers



MFJ-9020 20 Meter CW Transceiver High performance superheterodyne receiver with razor sharp 8-pole crystal filter, RIT, AGC, vernier tuning, pure sinewave, side tone, speaker, headphone jack, adjustable semibreak-in, 5 watt RF. Covers lower 20 Meter CW band. 6" x 6-1/2" x 2-1/4".

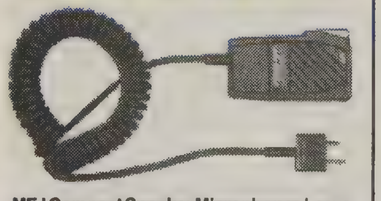
MFJ-9040 for 40 meters: 7.000-7.150 MHz.
MFJ-9030 for 30 meters: 10.100-10.150 MHz.
MFJ-9017 for 17 meters: 18.068-18-110 MHz.
MFJ-9015 for 15 meters: 21.000-21.200 MHz.
MFJ-412 plug-in Curtis Chip Keyer.
MFJ-726 plug-in audio filter.

SSB Station

MFJ-9420B 20 Meter SSB Travel Radio™ is the smallest rig of its kind. It is a complete station, microphone, power supply and antenna and fits in your brief-case. With an output of 12 watts you can work the world. With RF speeach processing you focus all your power into a clear signal.

Plug in the optional MFJ-415 module ($39.95) and operate CW from 14.000-14.100 MHz. Has semi break-in, sidetone and key jack.
HRO Price
MFJ-9429 $219.95 (no mic)
MFJ-9429X $229.95 (special with mic)
MFJ-290 Microphone $29.95

HT Speaker / Mikes

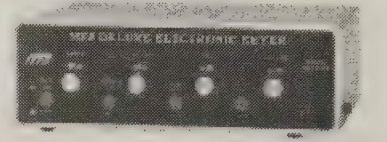


MFJ Compact Speaker Microphones Leave your HT on your belt while talking or monitoring calls. The mikes feature a handy lapel/pocket clip letting you place it close to the ear for easy listening. Each mike includes an electret element plus an earphone jack.
MFJ-284 fits Icom, Yaesu.
MFJ-286 fits Kenwood.

MFJ Mini Speaker / Microphone provides a microphone in a miniature package for the newest HTs. Each microphone is equipped with an electret element, wide range speaker, earphone jack, PTT and retractable cord. You get a swiveling lapel/pocket clip. The models with the "L" provide an "L" connector for those HTs requiring this type.
MFJ-285 fits Icom, Yaesu, & some Alinco.
MFJ-285L MFJ-285 with an "L" connector.
MFJ-285W fits Icom IC-W2A
MFJ-287 fits Kenwood.
MFJ-287L MFJ-287 with an "L" connector.
MFJ-283 fits the dual connector Alinco.

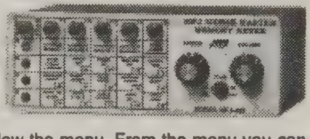
MFJ Keyers

MFJ-422B Keyer / Bencher Paddle combo makes a small, attractive unit that is a pleasure to use. Iambic keying, adjustable weight and tone, front panel volume and speed controls (8-50 WPM), dot-dash memories, sidetone, speaker and automatic or semi-auto/tune modes. Use 9 V battery or 110 VAC with optional MFJ-1305. *HRO Price $134.95*
MFJ-422BX Keyer only. Mount to your Bencher paddle. *HRO Price $79.95*



MFJ-407B Deluxe Electronic Keyer uses Curtis 8044-ABM IC chip. Dot-dash memories, self-completing dots and dashes, jam-proof spacing, RF proof, instant start. Single squeeze, or straight key. Controls include speed, weight, tone and volume. ON/OFF, tune auto/semi-auto, built-in speaker, 9V battery (not included) or 110 VAC with optional MFJ-1305. *HRO Price $69.95*

MFJ-401B Econo Electronic Keyer II. Similar to MFJ-407B but with external speed and volume controls, internal weight and tune controls. Use 9V battery (not included) or 110 VAC with optional MFJ-1305. *HRO Price $49.95*

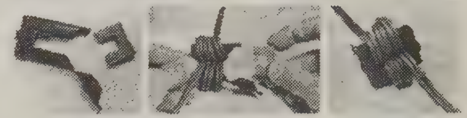


MFJ-492 New Menu Driven Memory Keyer. No keypad, no complex sequences to remember. Just follow the menu. From the menu you can save and play messages, decrement serial numbers, set speed, weight, sidetone, iambic, semi-auto, handkey, message queue, paddle command modes — turn off on/off sidetone, transmitter tune, keying output on/off — select iambic A or B, reverse paddle, Morse trainer and store starting serial number. Commands can also be keyed from the paddle. Holds 192 characters in four soft sectored message memories. Expandable to more than 8000 characters in eight message memories. Memories have lithium battery backup. Front panel controls for speed (5-100 WPM) and volume. Built-in speaker for side tone. Direct and grid block keying output. Uses 9 V battery or optional 110 VAC with MFJ-1312B. *HRO Price $CALL*
MFJ-493. Like MFJ-492 but with 32K characters of memory. Has IBM keyboard input to make MFJ-493 into a keyboard. QSO simulator also included. *HRO Price $139.95*
MFJ-490 Memory keyer / Bencher Combo. Has all the features of the MFJ-492 except memory expansion.
HRO Price $CALL
MFJ-490X. MFJ-490 less the Bencher paddle.
HRO Price $99.95
MFJ-451 Morse Keyboard. Stand alone CW keyboard. 200 character type ahead buffer and two 100 character message memories. Use 12 VDC or optional MFJ-1312B.
HRO Price $89.95

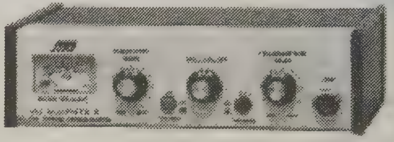
MFJ-557 Deluxe Code Practice Oscillator features a Morse straight key on a non-skid heavy steel base with volume control, tone control, earphone jack, external speaker plug, 9 V battery (not included) or optional AC power supply. Built-in speaker, adjustable contacts. *HRO Price $24.95*

Station Accessories

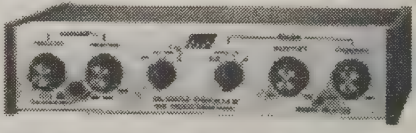
MFJ-931 Artificial RF Ground effectively places your rig near actual earth ground potential. Connects between your rig and random length of wire of a connecting ground wire. Tune for maximum ground current using the built-in RF ammeter. Covers 1.8 to 30 MHz. *HRO Price $79.95*



MFJ-701 RFI Free Choke Kit. Four square ferrite toroids formulated for eliminating RFI from .5 to 200 MHz. Separates into tough snap-together plastic halves for easy winding. Package of 4. *HRO Price $14.95*

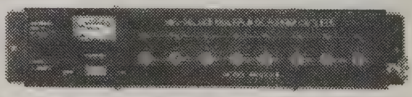


MFJ-624D Deluxe Hybrid Phone Patch has prewired microphone connector, programmable for most radios. VOX/push-to-talk, RF pi-filters, and PC board construction eliminates RF feedback. VU meter, separate transmitter and receiver gain controls, null control, standard phone connection—RJ-11, jacks for speakers, audio in and audio out. Use 12 VDC, 9 V battery (not included) of 110 VAC with optional MFJ-1312. *HRO Price $69.95*



MFJ-752C SSB / CW Audio Filter dual mode tunable filter tunes from 300 to 3000 Hz, bandwidth from 40 Hz to almost flat. Notch depth to 70 dB, works any rig, 2 watts for speaker, switch selectable, noise limiter for impulse noise, OFF bypassess filter. Use 9-18 VDC or 110 VAC with optional MFJ-1312. *HRO Price $99.95*

MFJ-722 Optimizer SSB / CW Audio Filter offers switch selectable bandwidths (80, 110, 150, 180 Hz centered on 750 Hz), steep-skirted SSB filtering, 300-3000 HZ tunable 70 dB notch filter. Plug-in phone jack, speaker, built-in 2 watt amp, headphone jack. 9-18 VDC of 110 VAC with optional MFJ-1312. *HRO Price $79.95*



MFJ-1116 Deluxe Multiple DC Power Outlet. 8 outlets for powering accessories. Connects to 12 VDC power VDC power supply, monitors DC voltage with voltmeter, power switch and 15 amp fuse. 5-way binding posts with standard spacing for dual banana jacks. *HRO Price $44.95*

MFJ-1112 like MFJ-1116 without ON/OFF switch, voltmeter and fuse. 6-pair outlets. *HRO Price $29.95*

MFJ-1118 High Current Multiple DC Outlet. Gives you two HF and/or VHF transceivers and six or more accessories from your transceivers's main 12 VDC power supply. Two pair of 30 amp binding posts RF bypassed and individually fused for transceivers. Six additional pair of binding posts are fused and handle a total of 15 amps. ON/OFF power switch and LED power indicator. 0-25 V monitor meter. 6 feet, eight gauge cable with ring tongue terminals. *HRO Price $64.95*

MFJ HF Antennas

NEW!

HF Box Fan
Portable Loop Antenna
MFJ -1780

MFJ-1780 is a high efficiency portable loop antenna that measures only 24" x 24" x 6". It is extremely portable yet it covers 14 to 30 MHz including the WARC bands. This is a real transmitting loop antenna using all welded construction for lowest loss, highest efficiency and maximum radiated power. It uses the same all welded butterfly tuning capacitor as the MFJ Super Hi-Q Loop™. You do not need a ground, radials, counterpoise or antenna tuner. It includes remote control with fast tune and slow tune buttons. A separate control cable is not needed. Uses 9 volt batteries or 100 VAC with optional AC adapter.
Suggested List $229.95

NEW!

Super 80 / 40 Meter
Vertical Antenna
MFJ -1792

MFJ-1792 is designed as a high performance antenna for 80 and 40 meters. It features a full size quarter wave radiator for 40 meters - a full 33 feet. End loading is used for 80 meters. This is accomplished by a low loss 4.5 foot capacitance hat and a high-Q coil wound with Teflon wire on a low loss fiberglass form. The entire length of the antenna is always radiating power. It has a built-in L-network for the lowest SWR and is constructed from high strength 6061-T6 aluminum tubing, super strong fiberglass insulating rod and stainless steel hardware. The antenna handles up to 1500 watts PEP and includes a heavy duty mount. The antenna does require guying and radials, counterpoise or ground screen for maximum performance.
Suggested List $159.95

NEW!

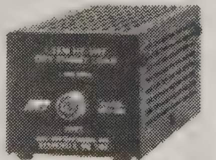
80 / 40 / 20 Meter
Vertical Antenna
MFJ -1793

MFJ-1793 is the same as the MFJ-1792 but includes a full size 20 meter quarter wave radiator.
Suggested List $179.95

MFJ Dummy Loads

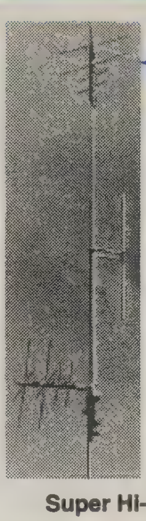
MFJ-250 1 kW Dummy Load 50 ohm oil-filed dummy load. Low VSWR to 400 MHz. Rated 1 kW CW or 2 kW PEP for 10 minutes. 1/2 rating for 20 minutes. 200 watt CW or 400 watt PEP continuous. Includes high quality transformer oil (no PCB). *HRO Price $49.95*

MFJ-260B VHF / HF Dummy Load. Air cooled, 50 ohm resistor in perforated metal housing with SO-239 connectors. For 30 seconds, derating curve to 5 minutes. *HRO Price $28.95*



MFJ-264 UHF / VHF / HF Dry Dummy Load covers up to 650 MHz, usable to 750 MHz. Rated 1.5 kW for 10 seconds, 100 watts continuous. *HRO Price $59.95*

MFJ-704 Low Pass Filter suppresses TVI, RFI, telephone and other interference. Handles full legal power with 2:1 SWR load for 1.8-30 MHz. *HRO Price $39.95*

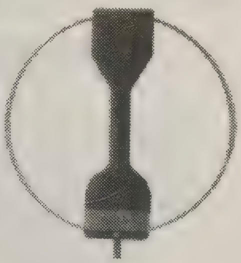


NEW!

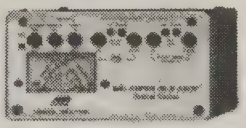
HF Vertical Antenna
No Radials

MFJ-1798 Halfwave Vertical. No radials needed. Covers 10 bands: 75/80, 40, 30, 20, 17, 15, 12, 10, 6 and 2 meters. You do not need ground radials or ground because of the effective counterpoise that is 12 feet across. You can mount it from ground level to roof top. The feed line is isolated from the antenna using MFJ's AirCore™ balun. Full size performance is achieved by using separate full size radiators for 2 through 20 meters and high efficiency end-loading for 30, 40 and 75/80 meters. UPS shippable.
Sugg. List $269.95
MFJ-1796 6 Band Vertical
Sugg. List $189.95

Super Hi-Q Loop 36" Diameter



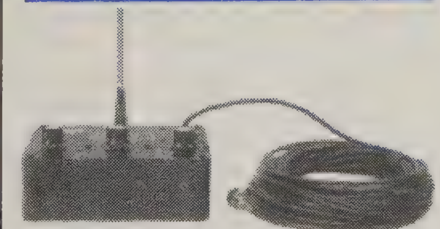
MFJ-1786 Super Hi-Q Loop Antenna. Only 36 inches in diameter, it is the smallest high efficiency 10 to 30 MHz continuous coverage antenna ever made for ham radio. Features a round conductor that is more efficient than a flat strip. No control cable needed. All welded construction. Welded butterfly capacitor with no rotating contacts. It is totally portable. Built-in mounting bracket makes it easy to mount vertically or horizontally. Handles nominal 150 watts with low SWR.



Remote control (included) with Automatic Band Selection, fast and slow tune, audio alert and built-in cross-needle SWR/wattmeter. Uses internal AA batteries (not included), 12 VDC or 110 VAC with optional MFJ-1312. *Sugg. List $299.95*

MFJ-1782 Super Hi-Q Loop Antenna. Same as MFJ-1786 but with standarad controller. Does not have SWR / wattmeter or Auto Band Selection. *Suggested List Price $269.95*

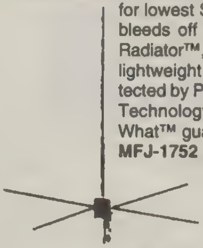
Portable Antenna



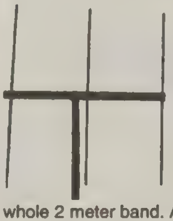
MFJ-1621 Portable Antenna lets you operate in almost any location. Works 40, 30, 20, 17, 15, 12 and 10 meters by using a telescoping whip antenna that extends to 54 inches. Self-standing cabinet, built-in antenna tuner, field strength meter and 50 feet of RG-58 coax cable. Handles 200 watts.
HRO Price $79.95

MFJ VHF Antennas

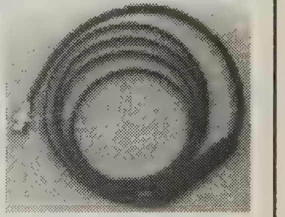
MFJ-1750 5/8 Wave Ground Plane 300 watt antenna for 2 meters gives you maximum possible gain of any single element antenna. Shunt fed matching network for lowest SWR over entire 2 meter and bleeds off unwanted static. Rapid-tune Radiator™, single U-bolt mounting, strong lightweight aluminum construction protected by Permanent Molecular Bonding Technology™ and 1 year No Matter What™ guarantee. *HRO Price $19.95*
MFJ-1752 220 MHz *HRO Price $19.95*



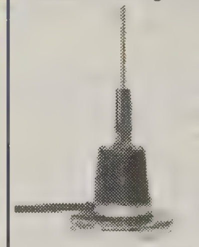
MFJ-1740 1/4 Wave Ground Plane 300 watt antenna for 2 meters. Minimizes feedline radiation for more useful, radiated power, reduced TVI and noise pickup by coax shield. Low loss ceramic insulator, single U-bolt mounting, Rapid Tune Radiator™, protected by Permanent Molecular Bonding Technology™, 1 year No Matter What™ guarantee. Cutting instructions for 220 and 440 MHz. *HRO Price $12.95*



MFJ-1763 Portable 3 Element Beam for 2 meters. Easy to store, elements simply screw into the boom. Extra gain and directivity. Compact 2-3/4 foot boom gives you a calculated gain within 1 dB of a four element Yagi. Thick elements maintain high gain and directivity over virtually the whole 2 meter band. A ferrite choke balun gives you excellent feedline decoupling. Coax coupling reduced by mounting the SO-239 connector behind the reflector. Mounts vertically or horizontally. Great for packet. Protected by Permanent Molecular Bonding Technology™, 1 year No Matter What™ guarantee. Weighs 2 pounds, single U-bolt mounting. *HRO Price $39.95*



MFJ-1730 Pocket Roll-UP™ gets base station performance on the go with this half-wave 2 meter J-antenna that sticks in your pocket. The perfect gain antenna for traveling. Omni-directional and significant gain over a 1/4 wave. Protected by 1 year No Matter What™ guarantee. *HRO Price $14.95*

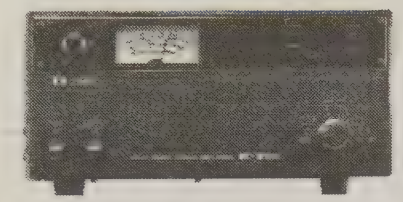


A. MFJ-1728 5/8 Wave 2 Meter Mobile Antenna covers 144-174 MHz with low SWR, 300 watts, magnetic mount, stainless steel radiator. 12 feet coax cable with PL-259 connector. Protected by 1 year No Matter What™ guarantee.
HRO Price $24.95

B. MFJ-1724B Dual Band Mobile Antenna gives you quarter wave stainless steel whips for 2 meters and 440 MHz, magnetic mount, coax and connector. Low SWR 200 watt antenna. 15 feet of coax with a connector ready to plug into your rig. Protected by the 1 year No Matter What™ guarantee.
HRO Price. $14.95

AMPLIFIERS

ICOM



IC-2KL

Icom's solid-state linear amplifier offers broadband tuning on 160-15 meters. No need to tune the amp as you go from band to band since automatic band switching information is provided directly from all Icom HF radios. A switch on the front of the amp can be used for band selection with other manufacturer's exciters. The 2KL requires 50-80 watts of drive. Nominal output in all modes is 500 watts. It is supplied with an external power supply, the IC-2KLPS, which operates on 110 (factory wired) or, with internal modification, 220 VAC.

IC-4KL

This HF amp features: 1000 watts out for one hour at full duty cycle, separate controller and amp, automatic high speed antenna tuner, full break-in operation, built-in 40 volt 60 amp power supply with automatic selection for 110 (factory wired) or 220 VAC. Comes with handles for rack mounting. 220 VAC is recommended.

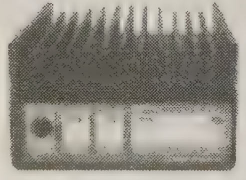
MIRAGE

VHF / UHF Amplifiers

Mirage / KLM designed their amps to the highest specifictations to provide reliability at an affordable price. The new GaAs-FET preamps provide a gain figure of more than 25 dB with a noise figure of less that .6 dB. Please see the chart on page 78 for detailed specs and model numbers. All the amps have a 5 year warranty and 1 year on the RF power transistors.

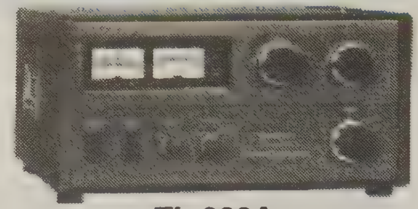
rfconcepts

VHF / UHF Amplifiers



For that "extra punch" needed for distant contacts, manyRF Concepts models feature GaAs-FET receiver preamps for weak signals. The amplifiers are all mode, solid-state and made in the USA. Each features a one year warranty on parts and labor and 6 months on the RF power transistors. See pages 53 and 78 for more details.

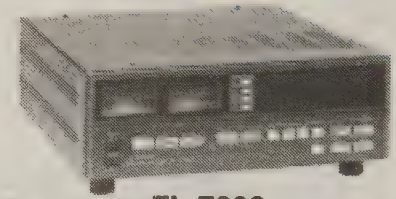
KENWOOD



TL-922A

Kenwood's amplifier uses two Eimac® 3-500Z tubes to provide maximum legal power. The amp covers 160-15m and is user modifiable for 10 meter operation. It requires 80 watts to produce full output power. The amp uses an AB2 class grounded grid circuit. The AC power supply is built-in and can be set for 110 or 220 VAC. Use this amp with all Kenwood HF models and most from other manufacturers. There is interlock protection on the covers and the amp is protected with a blower turn-off delay circuit. It can be shipped to many areas by Roadway Package Service or UPS (to some areas). Otherwise, the TL-922A must be shipped by truck or air freight due to its weight.

YAESU



FL-7000

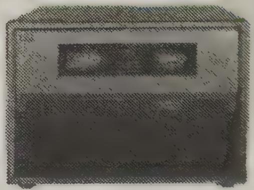
Yaesu's solid-state amplifier requires less than 100 watts to drive and produces 600 watts output power. It comes with a built-in automatic antenna tuner. The built-in power supply operates on 100-234 VAC, but an internal modification is required to change the voltage. The duty cycle on SSB is 30 minutes, or, for full carrier, 2 minutes. The amp obtains its band data directly from the Yaesu exciter and band changes are automatic. Band data can be selected from the front panel so the amp can be used with other manufacturer's exciters. The amp comes with an interface cable for the FT-757. Optional cables are required for the FT-767, FT-990, FT-1000 (E767), FT-890 (CT-11) or the FT-980 (E980).

VAN GORDEN

Use the Van Gorden Patch Cables to connect your amp to your rig. They are constructed from RG-8X coax with silver teflon PL-259 connectors. Use the longer cables for those antenna runs.

Model	Length (feet)	HRO Price
8X-1.5ST	1.5	$6.99
8X-3ST	3	$8.99
8x-6ST	6	$11.99
8X-12ST	12	$14.95
8X-18ST	18	$18.95
8X-50ST	50	$29.95
8X-100ST	100	$49.95

JRC



JRL-2000F

$4899.95

Suggested List—Call for Quote

The JRL-2000F has solved the problems of many conventional linear amplifiers: troublesome manual operation, fan noise, low margin of output and high IMD. The JRL-2000F is a heavy duty amp using 48 MOSFET for low distortion, high speed automatic antenna tuner, high efficient switching power supply, automatic antenna selector, and wireless remote control unit. Provides 1 kW output with a maximum input of 100 watts. Shipped by truck or FEDEX only. Shipping cost extra.

VHF / UHF Preamps

AMPIRE

Ampire's low noise pre-amplifiers for VHF and UHF automatically switch from receive to transmit when the transmitter is keyed. In receive mode they feature a helical filter with a narrow bandpass. In case of power loss, the relay will drop out of the transmit mode.

- **Model 146**: 2 meters, 19 dB gain, .75 dB noise. **List Price $179.95**
- **Model 146 OS**: 2 meters for Oscar operation. **List Price $179.95**
- **Model 440**: 430-440 MHz or 440-450 MHz, 16 dB gain, .75 dB noise. **List Price $209.95**

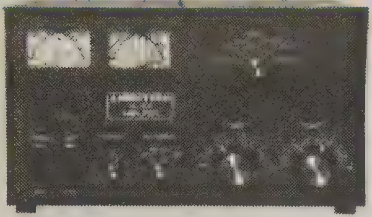
Please call for quotes.

LANDWEHR

Pre-Amps

Landwehr's affordable, high quality, mast-mounted preamps for the amateur come in three models: 2 meters, 220 MHz and 440 MHz. The GaAs-FET design provides gains up to 18 dB with a low noise figure. Features include type-N connectors and automatic T/R switching up to 150 watts. The preamp is very popular with satellite and "weak signal" enthusiasts.

AMERITRON



AL-80B

$1195.95

Suggested List—Call For Quotes

Ameritron's **AL-80B** gets a full kW PEP output from a compact desktop linear that plugs into a 120 VAC outlet. You get 850 watts output on CW and 500 watts output on RTTY.

It covers all bands 160-15 meters including WARC and MARS , and it is user modifiable for 10/12 meters with the proper license.

The amp has an extra heavy duty power supply, Eimac® 3-500Z tube, nearly 70% efficiency, tuned input, Pi/Pi-L output, inrush current protection, multi-voltage transformer, dual cross-needle meters, QSK compatibility, two-year warranty, and it is made in the USA.

The AL-80B's exclusive **Dynamic ALC™** gives high-level low-distortion RF processing. When activated, it can more than double your average SSB power and produce up to 6 dB improvement in intelligibility. Maximize your talk power without distortion or splatter.

The AL-80Bs exclusive **Instantaneous RF Bias™** completely turns off the Eimac® 3-500Z tube (except filaments) between words and dots and dashes. It eliminates hundreds of watts wasted as heat to give you cooler operation and longer component life.

The heart of the AL-80B is its **Heavy Duty Power Supply**. A 25 pound transformer using a high silicone steel core, computer grade capacitors, heavy duty bleeders and ten 3 amp, 1000 V power rectifiers gives you 2700 volts fully loaded.

The AL-80B's exclusive **Multi-Voltage Power Transformer** lets you optimize for different line voltages. Select from 14 different primary voltages from 90-140 VAC and 205-250 VAC.

The fast open frame T/R relay in the AL-80B switches nearly as fast as some vacuum relay QSK T/R switches. For lightening fast **QSK Operation** use the optional external QSK-5 PIN diode T/R switch.

Step-Start Inrush Protection™ stops damaging in-rush current with a start-up sequence that is easy on the tube and power supply components.

Ameritron's **Dual Illuminated Cross-needle Meters** monitor four separate functions.

A 50 ohm broadband Pi-network **Tuned Input Circuit** is used to ensure maximum power transmitted from your rig.

Legal Limit Linears

These rugged linears use a super heavy duty hypersil® power supply capableof 2500 watts!

AL-1500

Ameritron's super power amplifier, AL-1500 uses the herculean Eimac® 8877 ceramic tube. It is so powerful that 65 watts drive gives you full legal output, and it is just loafing. The power supply is capable of 2500 watts PEP. **Suggested List $2625.95**

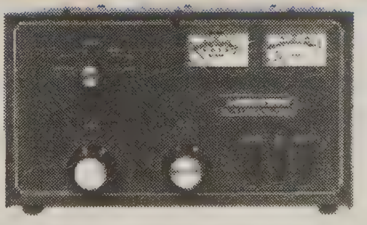
AL-82

The AL-82 linear gives you full legal output using a pair of Eimac® 3-500Z tubes. Some competing linears using dual 3-500Zs do not give you 1500 watts because their lightweight power supplies are unable to drive the tubes to their full potential. **Suggested List $1995.95**

AL-1200

Get ham radio's toughest tube with Ameritron's AL-1200 —the Eimac® 3CX1200A7. It has a 50 watt control grid dissipation—12 times tougher than the 4 watt rating of the 3CX800A7. You get the same full legal output as you get from a pair of 3CX800A7s. **Suggested List $2095.95**

600 Watts Out

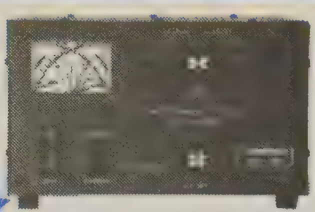


AL-811 (H)

These low-cost HF amps give you plenty of power to burst thru QRM. Both desktop linears are so compact they will slip right into your ham shack and plug into your nearest 120 VAC outlet. You get three (or four) tough 811A transmitting tubes plus an extra heavy duty power supply, all HF band coverage, pressurized ventilation, tuned input, dual illuminated meters, adjustable ALC, operate/stand-by switch, transmit LED, UPS shippable.

AL-811 3 tube model / 600 watts output.
Suggested List $649.95
AL-811H 4 tube model / 800 watts output.
Suggested List $795.95

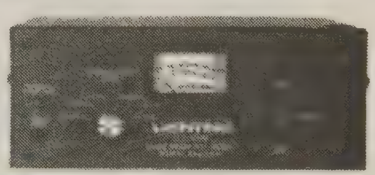
Solid State HF Amps



NEW!

ALS-600

Ameritron now has a no-tune solid-state FET amplifier for HF base station use. It features no tuning, 700 watts output, continuous 1.5-22 MHz coverage, instant band switching and fully SWR protected. Includes an operate/standby switch; front panel ALC control; LED indicators for transmit, ALC SWR; illuminated cross-needle SWR/wattmeter. The included separate ALS-600PS power supply comes wired for 120 VAC. **Suggested List $1299.95**



NEW!

ALS-500M

For mobile, 13.8 VDC operation, the ALS-500M is the amplifier. It features 600 watts output with continuous 1.5-22 MHz coverage. Remote ON/OFF control. Optional 10/12 meter kit. **Suggested List $799.95**

Antenna Tuner

Ameritron—*the high power specialists*—brings you a tuner designed for legal limit amplifiers. Heavy duty silver plated bandswitch virtually eliminates switch failure. High power transmitting capacitors. 1.8-30 MHz. Peak reading SWR/wattmeter. 6 position antenna switch. Selectable 1:1 or 4:1 balun. Meter lamps require 12 VDC. **Suggested List $399.95**

Remote Coax Switches

RSC-8V, DC-UHF 5 kW Coax Switch. Replace 5 coax feedlines with one with this Remote Coax switch. Weatherproof box mounts outdoors on your tower or mast. Attractive control unit sits on your operating desk.. Low SWR to 450 MHz. Low loss. Rated at 5 kW to 30 MHz, 1 kW at 150 MHz. *Sugg List RCS-8V $149.95 ; RCS-8VN with "N" connectors $169.95.*

RCS-4 is a 4 position HF coax switch. It is similar to the RCS-8V. No control cable is required. 2500 watts PEP, *Sugg. List 134.95.*

AMPLIFIERS

HRO will provide 10 meter modification information to amplifier customers upon receipt of a copy of your valid, current amateur radio license.

Manufacturer	Model	Frequency Range	Modes	Power In	Power Out	Voltage	Current	Pre-amp	Connector	Wgt	LIST Price
Ameritron	AL-1500	160-15 M*	SSB. CW	65 W	1500+ W	220 VAC	15 A	–	SO-239	50 lbs#	$2,625.95
	AL-1200	160-15 M*	SSB. CW	100 W	1500 W	220 VAC	15 A	–	SO-239	50 lbs#	$2,095.95
	ALS-500M	160-15 M*	SSB. CW	100 W	600 W	13.8 VDC	80 A		SO-239	7 lbs	$799.95
	ALS-600	160-15 M*	SSB. CW	100 W	700 W	110/220 VAC	12 A 110V		SO-239	13 lbs#	$1,299.95
	AL-80B	160-15 M*	SSB, CW	100 W	1000 W	110/220 VAC	15/10 A	–	SO-239	54 lbs	$1,195.95
	AL-811	160-15 M*	SSB, CW	75 W	600 W	110/220 VAC	8/4 A	–	SO-239	40 lbs	$649.95
	AL-811H	160-15 M*	SSB, CW	75 W	800W	110/220 VAC	8/4 A	–	SO-239	41 lbs	$795.95
	AL-82	160-15 M*	SSB, CW	100 W	1500 W	220 VAC	15 A	–	SO-239	52 lbs#	$1,995.95
Icom	IC-2KL	160-15 M*	SSB, CW	100 W	500 W	110/220 VAC	20 A 110V	–	SO-239	45 lbs	$2,159.95
	IC-4KL	160-15 M*	SSB,CW	100 W	1000 W	110/220 VAC	18 A 220V	–	SO-239	80 lbs	$8,021.95
JRC	JRL-2000F	160-12 M*	SSB,CW	100 W	1000 W	110/220 VAC	2.5 kVA	–	SO-239	62 lbs	$4,899.95
Kenwood	TL-922A	160-15 M*	SSB, CW	100 W	1500 W	110/220 VAC	20/10 A	–	SO-239	83 lbs	$2,099.95
Mirage	A -1015-G	50-54 MHz	All	10 W	150 W	13.8 VDC	20-25 A	–	SO-239	5 lbs	$367.95
	A -1035-G	50-54 MHz	All	10 W	350 W	30 VDC	18-22 A	–	SO-239	5 lbs	$616.95
	B-23-G	144-148 MHz	All	2 W	30 W	13.8 VDC	5 A	20 dB	SO-239	2 lbs	$167.95
	B-215-G	144-148 MHz	All	2 W	150 W	13.8 VDC	20-25 A	25 dB	SO-239	5 lbs	$356.95
	B-108-G	144-148 MHz	All	10 W	80 W	13.8 VDC	20-25 A	10 dB	SO-239	3 lbs	$214.95
	B-1016-G	144-148 MHz	All	10 W	160 W	13.8 VDC	20-25 A	10 dB	SO-239	5 lbs	$356.95
	B-2516-G	144-148 MHz	All	25 W	160 W	13.8 VDC	20-25 A	10 dB	SO-239	5 lbs	$300.95
	B-2530G	144-148 MHz	All	25 W	300 W	13.8 VDC	48 A		SO-239	15 lbs	$648.95
	B-2560G	144-148 MHz	All	30 W	300 W	28 VDC	42-52 A		SO-239	15 lbs	$1,032.95
	B-5060G	144-148 MHz	All	50 W	600 W	28 VDC	42-52 A		SO-239	15 lbs	$1,032.95
	B-5016-G	144-148 MHz	All	50 W	160 W	13.8 VDC	20-25 A		SO-239	5 lbs	$300.95
	C-22-G	220-225 MHz	All	2 W	20 W	13.8 VDC	5 A		SO-239	2 lbs	$167.95
	C-1012-G	220-225 MHz	All	10 W	120 W	13.8 VDC	18-20 A		SO-239	5 lbs	$337.95
	C-106-G	220-225 MHz	All	10 W	60 W	13.8 VDC	10-12 A		SO-239	4 lbs	$225.95
	C-211-G	220-225 MHz	All	2 W	110 W	13.8 VDC	18-20 A		SO-239	5 lbs	$337.95
	C-2512-G	220-225 MHz	All	25 W	120 W	13.8 VDC	16-18 A		SO-239	5 lbs	$315.95
	D-26N	420-450 MHz	All	2 W	60 W	13.8 VDC	12 A	–	N type	2 lbs	$267.95
	D-1010N	430-450 MHz	All	10 W	100 W	13.8 VDC	20 A	–	N type	5 lbs	$391.95
	D-3010N	420-450 MHz	All	30 W	100 W	13.8 VDC	20 A	–	N type	6 lbs	$361.95
RF Concepts	2-23	143-149 MHz	All	.5-5 W	(2 in) 30 W	13.8 VDC	4 A	20 dB	SO-239	2 lbs	$149.95
	2-70	143-149/430-450 MHz	FM	5	30 / 20 W	13.8 VDC	4 A		BNC	3 lbs	$259.95
	2/70G	143-149/430-450 MHz	FM	5	30 / 20 W	13.8 VDC	4 A	15 db	BNC	3 lbs	$289.95
	2/70H	144-148/438-450 MHz	FM	20-50 W	200 / 125 W	13.8 VDC	40 A	–	N type	11 lbs	$849.95
	2-315	143-149 MHz	All	5-50 W	(40 in) 170 W	13.8 VDC	22 A	20 dB	SO-239	5 lbs	$299.95
	2-417	143-149 MHz	All	.2-50 W	(40 in) 170 W	13.8 VDC	22 A	20 dB	SO-239	5 lbs	$299.95
	3-22	220-225 MHz	All	.2-5 W	(2 in) 20 W	13.8 VDC	4 A	15 dB	SO-239	2 lbs	$149.95
	3-112	220-225 MHz	All	.2-15 W	(10 in) 120 W	13.8 VDC	22A	18 dB	SO-239	5 lbs	$359.95
	3-211	220-225 MHz	All	.2-5 W	(2 in) 110 W	13.8 VDC	22A	18 dB	SO-239	5 lbs	$359.95
	3-312	220-225 MHz	All	.2-30 W	(30 in) 120 W	13.8 VDC	20 A	18 dB	SO-239	5 lbs	$329.95
	4-310	420-450 MHz	All	.2-40 W	100 W	13.8 VDC	20 A	12 dB	N type	5 lbs	$379.95
	4-110	420-450 MHz	All	.2-15 W	100 W	13.8 VDC	22 A	12 dB	N type	5 lbs	$399.95
	4-32	420-450 MHz	All	.2-5 W	(3 in) 20 W	13.8 VDC	4 A	12 dB	SO-239	2 lbs	$399.95
	VHF-1-60	144-148 MHz	FM	1 W	60 W	13.8 VDC	9 A	17 dB	SO-239	7 lbs	$259.95
Yaesu	FL-7000	160-15 M*	SSB, CW	100 W	600 W	110/220 VAC	20/10 A	–	SO-239	60 lbs	$2,459.95

* Owner modifiable for 10 meters # Add 35 pounds for transformer shipped in separate package.

QRZ!

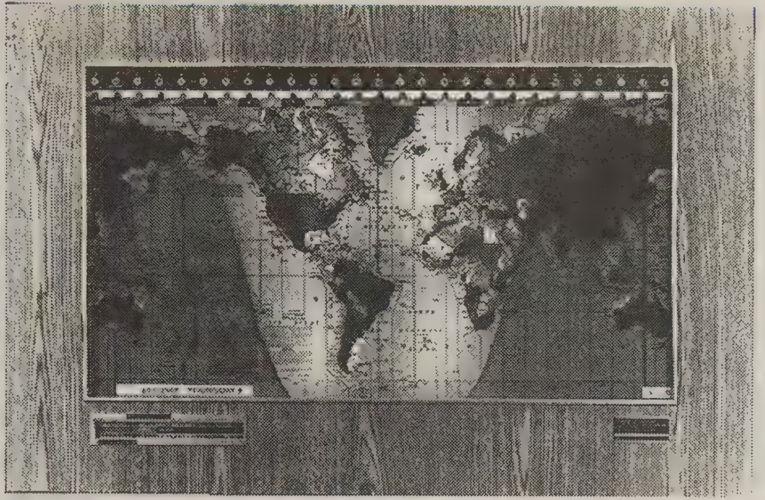
Ham radio and short wave enthusiasts will be pleased with the latest edition. QRZ now supports Windows 3.1. Of particular interest is the new QRZWIN call sign search and retrieval software that allows users to easily access more than 600,000 names and addresses of US and Canadian hams. The full name, address and FCC license information is included with each record.

QRZWIN provides editing and printing functions which make custom mailing lists easy. Import the information to your favorite word processor for advanced formatting and list processing. It features an open database with documentation so users can create their own custom applications. Several ham radio logbook utilities support the QRZ database. DOS routines are included for non-Windows users.

Also included on the CDROM are the complete text to the FCC approved license examinations, questions and answers, current rules and regulations, and 100's of shareware utilities. **HRO Price $29.95**

Ham Radio CDROM for DOS and Windows

Clock



GEOCHRON

Global Time Indicator

HRO Price $999.95

Geochron is a true global time indicator showing the correct time everywhere in the world. It shows day of the week, date of the month, the sun's zenith position, and the distribution of daylight and darkness on the surface of the earth. The Geochron can be mounted on any flat surface like a picture or it can be recessed into the wall with optional flush mounting brackets. Dimensions 34" X 22". Geochron Standard Model is shown without minute indicator. Deluxe version with minute indicator is available at $1149.95. Various color finishes and trim are available to select from.

AZIMUTH

World RadioSphere Globe

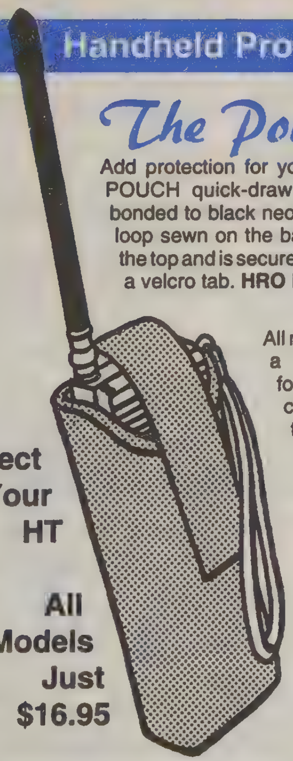
$99.95
HRO Price

Awards QSL Library™

Throw out the shoe boxes and get organized. Each handsome album is custom designed with 20 crystal-clear pocket pages—enough for 120 QSL cards. Add extra pages as your collection expands . . . up to 40 pages or 240 cards per album. Collect your cards for each radio award in its own album:

Model	Description	HRO Price
QSL Album	Standard QSL Album	$19.95
QSL Album-DXCC	DXCC Album	$19.95
QSL Album-WAZ	WAZ Album	$19.95
QSL Album-WAS	WAS / WAC Album	$19.95
Pages	20 Extra Pages	$12.95

Handheld Protector



The Pouch

Add protection for your HT with THE POUCH quick-draw holsters. Nylon bonded to black neoprene. Web belt-loop sewn on the back extends over the top and is secured on the front with a velcro tab. **HRO Price $16.95**

All models come with a "bottom-bumper" foam block, which can be removed by the user in an instant to accommodate bigger batteries.

Protect Your HT

All Models Just $16.95

Manufacturer	Radio Model	Pouch Model	Comments
Alinco	DJ-580T	Short	for short battery EBP-20N
		Short 2	for short battery EBP-22N
	DJ-180T	Short S1	low power battery
		S2	hi-power battery
	DJ-560T	470	
Icom	D1A	G	
	2iA	P-5	
	4iA	P-5	
	02AT/03AT	G	with standard battery
		Long-9"	with long battery
	2SAT/P2AT	P-5	
		SS	super small 6"
	24AT	SLIM(7")	for standard battery
	W2A	Short 2	for standard battery
		SLIM-X	for extended life batteries
	2SRA	Short 2	for standard battery
		SLIM-X	for extended life batteries
	W21AT	Short 2	
Kenwood	TH-27A	SS	
	TH-28A/48A	Short S1	
	TH-78A	Short 2	
	TH-225	G	Generic 8"
	TH-50/60	50	
Standard	C168A/468A	Short S1	
	C*88A	Short 2	all C188A/288A/488A
	C*28A	Short 2	all C528A/228A/628A/558A
Yaesu	FT*11	Short	standard battery FT-411/8121/911
		Short 2	extended battery FT-411/8121/911
	FT-415	SS	
	FT-470	470	
	FT-530	Short 2	

POWER SUPPLIES

ASTRON CORPORATION

Astron's solid-state electronically regulated **Power Supplies** have fold-back current limiting to protect from excessive current. Heavy duty heat sink. Output voltage: 13.8 VDC + -.05 volts. 220 V power supplies available on special order at slightly higher price.

RS-A Series Standard power supply with on / off switch. Voltage may be adjusted internally.

RS-M Series Power supply with front meters. One is for voltage and the other current.

VS-M Series Power supply with separate volt and amp meters. Adjustable output voltage from 2-15 volts.

RM Series 19" x 5 1/4" rack-mount power supplies available with or without meters and may be variable. The newest is the RM-60 with and without meters.

SL Series Slim Line series for a low profile installation.

KENWOOD

Kenwood's four power supplies go with their HF, VHF and UHF radios. All power supplies are 110 VAC only and some are UL approved. The **PS-31** is designed to go with the TS-790A. The **PS-33** and the **PS-53** are especially for the TS-450S and TS-690S. The **PS-52** is Kenwood's largest. It is designed for the TS-850 but it will run all Kenwood 12 VDC radios.

ICOM

Icom has two external power supplies to use with their radios which have 12 VDC power requirement. The **PS-55** is a standard duty supply with a cabinet styling to match IC-735/728/729. The **PS-30** is a heavy-duty station supply that can operate several base station units. The **PS-35** is an internal suppply designed to be installed in the IC-751 or selected VHF/UHF base transceivers.

YAESU

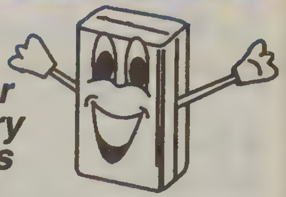
Yaesu has two power supplies designed primarily to be used with their HF radios. The **FP-757HD** is a heavy-duty supply with a built-in speaker and cabinet styling to match the FT-757GX. The **FP-800** is designed to match the FT-890 and also contains a built-in speaker.

Power Supplies

Manufacturer	Model	Cont.Duty 13.8 VDC	Intermit Duty	Height in	Width in	Depth in	Weight lbs	Sugg. List
Astron	RS-4A	3 A	4 A	3.75	6.5	9	5	$51.95
	RS-7A	5 A	7 A	3.75	6.5	9	9	$68.95
	RS-10A	7.5 A	10 A	4	7.5	10.75	11	$84.95
	RS-12A	9 A	12 A	4.5	8	9	13	$99.95
	RS-20A	16 A	20 A	5	9	10.5	18	$121.95
	RS-35A	25 A	35 A	5	11	11	27	$197.95
	RS-50A	37 A	50 A	6	13.75	11	46	$285.95
	RS-70A	57 A	70 A	6	13.75	13.75	48	$339.95
	RS-12M	9 A	12 A	4.5	8	9	13	$159.95
	RS-20M	16 A	20 A	5	9	10.5	18	$144.95
	RS-35M	25 A	35 A	5	11	11	27	$204.95
	RS-50M	37 A	50 A	6	13.75	11	46	$314.95
	RS-70M	57 A	70 A	6	13.75	12.12	48	$372.95
	RM-35A	25 A	35 A	5.25	19	12.5	38	$309.95
	RM-50A	37 A	50 A	5.25	19	12.5	50	$326.95
	RM-60A	50 A	55 A	7	19	12.5	63	$422.95
	RM-35M	25 A	35 A	5.25	19	12.5	38	$318.95
	RM-50M	37 A	50 A	5.25	19	12.5	50	$354.95
	RM-60M	50 A	55 A	7	19	12.5	63	$467.95
	VS-20M	16 A	20 A	5	9	10.5	20	$170.95
	VS-35M	25 A	35 A	5	11	11	29	$238.95
	VS-50M	37 A	50 A	6	13.75	11	46	$330.95
	SL-11A	7 A	11 A	2.75	7.62	9.95	11	$90.95
	SL-15R	12 A	15 A	2.75	7.62	9.95	14	$119.95
ICOM	PS-30	20 A	25 A	4.3	9.5	11.8	15.6	$407.95
	PS-35	17 A	20 A	*	*	*	6	$239.95
	PS-55	15 A	20 A	4.2	7.2	10.5	17.5	$265.95
Kenwood	PS-31	20 A	22.5 A	4.7	6.9	12.2	17.4	$219.95
	PS-33	20.5 A	22.5 A	6.81	3.78	11.66	15.4	$239.95
	PS-52	22.5 A	22.5 A	4.25	7	12.25	16	$289.95
	PS-53	22.5 A	22.5 A	6.81	3.78	11.66	15.2	$269.95
Yaesu	FP757HD	15 A	20 A	3.7	9.5	9.3	3.2	$334.95
	FP-800	20A	20A	3.66	9.4	9.3	15	$309.95

* Internal Supply (220 volt versions of some models available at additional cost by special orde
Contact HRO for details.)

PERIPHEX



Super Battery Packs

Made for Hams by Hams

Periphex makes a collection of Super Battery Packs for all the popular handheld radios. HRO now stocks these packs to provide you superior battery performance at an affordable price.

The Super models offer additional operating time when compared to manufacturer provided batteries. Depending on the battery model and radio, an additional 15% to 100% operating time can be achieved.

Examine the tables below and select the pack which best suits your needs.

Most Alinco Radios

Model	Volts (DC)	Capacity (mah)	HRO Price
EBP-22S	12	800	$65.95
EBP-24S	7.2	1500	$62.95

Most Icom Radios

Model	Volts (DC)	Capacity (mah)	HRO Price
BP-7S	13.2	1200	$65.95
BP-8S	9.6	1200	$65.95
BP-83S	7.2	750	$43.95
BP-84S	7.2	1400	$63.95
BP-85S	12	800	$76.95

Most Kenwood Radios

Model	Volts (DC)	Capacity (mah)	HRO Price
PB-7S	7.2	1400	$59.95
PB-8S	12	800	$59.95
PB-13S	7.2	1200	$49.95
PB-14S	12	400	$60.95

Most Yaesu Radios

Model	Volts (DC)	Capacity (mah)	HRO Price
FNB-12S	12	600	$54.95
FNB14S	7.2	1400	$59.95
FNB-26S	7.2	1400	$65.95
FBN-27S	12	800	$65.95

HANDHELD BATTERY PACKS

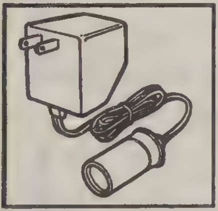
INNOVA

Portable Power for Serious HT Users

6.5AH DC PowerPack

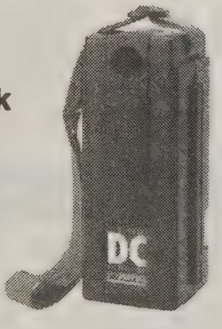
Innova's DC PowerPack provides DC power to run most HTs up to 15 times longer than replacement nicad packs. The sealed lead acid battery is rechargeable up to 1,000 times and delivers a full 6.5 amp hours of 12 VDC power to boost HTs to their maximum rated output.

The unit uses a standard cigarette lighter socket so all you need is your HT and its dedicated DC adapter. The DC PowerPack can easily run any other 12 VDC accessory up to 10 amps. It comes complete with a built-in handle and shoulder strap, overcharge protection, DC charger for charging in a vehicle and LEDs that monitor the battery status. HRO Model **"Power Pack" HRO Price $69.95**



AC Charger

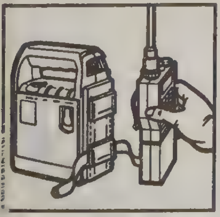
Recharges the 6.5 AH DC PowerPack at home in 8 to 10 hours. HRO Model **"AC CHGR" HRO Price $14.95**



3.0AH DC Powerpack

This model is a smaller, more compact DC PowerPack that provides a full 3 amp hours of 12 VDC power. It has a sealed lead acid battery that is rechargeable up to 1,000 times. It can boost most HTs to their maximum rated output while lasting up to seven times longer than replacement nicad packs.

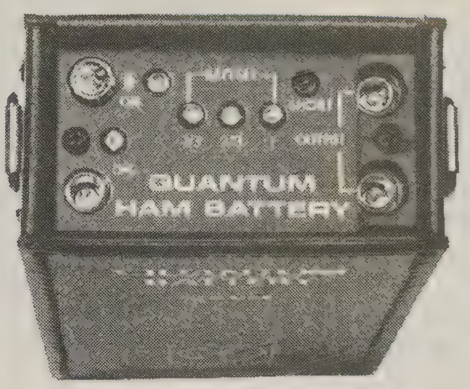
The unit comes with a convenient shoulder strap, AC charger for recharging at home, 10 amp fuse protection, and a standard cigarette lighter socket output for powering HTs (dedicated DC adapter required) or any other 12 VDC accessory. HRO Model **"Power Pack Small" HRO Price $59.95**



HT Clip Holder

Specially designed to securely mount on any Innova DC PowerPack modular side mounts. Fully adjustable to hold a variety of HT sizes. HRO Model **"HT CLIP" HRO Price $8.95**

QUANTUM INSTRUMENTS



All-day Power For Your Handheld!

The Quantum Ham Battery (model QHB) can power most models of handi-talkies 3 to 5 times longer than nicad packs. The battery delivers 12 volts for a 5 W output from most HT's.

The Quantum Ham Battery is modular and adaptable to many types of equipment. The power pack contains the rechargeable battery and electronics. Adapters with coiled cords connect the high performance power pack to an HT or other equipment.

One Ham Battery can be used for different equipment by switching adapters. This feature means a user need purchase only a new adapter when upgrading or changing to another HT instead of purchasing a whole new battery and chargers.

The Ham Battery is housed in a compact leatherlike case which can be belt-attached or hooked to a shoulder strap. Inside is a powerful 2.1 amp hour, high rate 12 volt rechargeable battery. The cells are sealed lead types. These can be recharged fully and reliably to 100% capacity at all times. The three-LED "fuel gauge" lets you know how much of the battery charge remains.

Included with the Ham Battery are a built-in automatic circuit breaker, recharge indicator and regulator. A charger is supplied with the battery. There are two output sockets for powering two pieces of equipment at once. **Suggested List Price $145.95**

Quantum Battery Adapters and Accessories

Model	Description	HRO Price
HB3	Icom "S" Series, IC-24AT, W2A, IC-2SRA, IC-4SRA, IC-R1.	$32.95
HB4	Icom "A" & "G" series except IC-24AT.	$32.95
HB5	Kenwood TH-205AT, 215A, 225A, 315A, 415A.	$32.95
HB6	Kenwood TH-25, 26AT, 45AT, 46AT, 75A, 77A.	$32.95
HB7	Yaesu FT-103R, 109R, 203R, 209R/RH, 703R, 709R, 727R.	$32.95
HB9	Yaesu FT-23R, 33R, 411, 470, 73R, 811, 911.	$32.95
HB10	Vehicle socket adapter.	$24.95
HB11	Alinco DJ-160, 460, 560T/E.	$42.95
HB13	Icom P Series IC-P2 / 3 / 4AT.	$42.95
HB16	Kenwood TH-27 / 28 / 47 / 48A /78A, Yaesu FT-416 / 816.	$42.95
HB19	Yaesu FT-26/ 76/ 415/ 815/ 530.	$42.95
HB20	DC Plug Set.	$28.95
HB21	Alinco DJ-F1T, DJ-F1T-HP.	$42.95
HB31	Alinco DJ-580T / DJ-180T.	$42.95
HB36	Vehicle fast charger.	$79.95
RA17	AC adapter for HB36.	$39.95
HB0	Coiled power cord for QHB.	$19.95
HB40	Quantum shoulder strap.	$12.95
HBCA-4	Standard C228 / 528 / 628A.	$42.95
HBCA-5	Standard C168 / 468A.	$42.95

ANTENNA TUNERS

SGC

The Smartuner, SGC's HF antenna coupler is a new breed of antenna tuner, combining fully-computerized operation with a wide range of antenna matching possibilities. It is a versatile, clever, automatic device with quite surprising capabilities even on random wires. The Smartuner also works with any HF rig! **Suggested List Price $550.00**

SGC
Smartuner

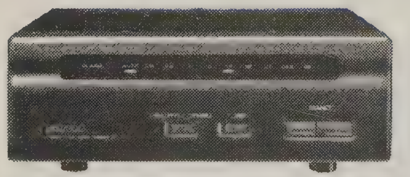
SG-230

SMARTUNER™

HF-SSB Antenna Coupler

- Tunes itself on an SSB signal. It does not need a constant carrier.
- Matches antennas from 2.5 to 27 meters long. A minimum length of 8 meters (25 feet) is required for 160 meter operation.
- Operates continuously from 1.8 to 30 MHz.
- Memorizes tuning which has already been done. There are 500 memory spots.
- The perfect addition to your marine-mobile installation.
- Tunes unknown antennas in just two seconds.
- Tunes a known antenna in milliseconds.
- Needs no bandswitching information, special low power tune-up or special wiring.
- 10 to 150 watts input power.
- Input impedance range is 45 to 55 ohms.
- DC operating voltage range is 10 to 15 VDC .9 amps.

KENWOOD



AT-50

A fully automatic antenna tuner to use with the TS-50 and other 100 watt HF transceivers. Useful for both mobile and fixed operation. Accurate tuning by pressing the AT TUNE key on the TS-50. Can be installed remotely. **Suggested List $354.95**

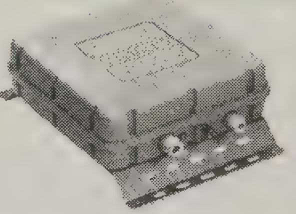
AT-300

A fully automatic antenna tuner to use with the TS-850, TS-690, TS-450 and TS-50. Designed to tune random wires or a mobile whip. The perfect tuner for mobile operation. **Suggested List $669.95**

AT-450

The AT-450 is an automatic tuner specially designed to operate inside the TS-450S and the TS-690S. It can easily be installed in the field by the ham. **Suggested List $234.95**

YAESU



FC-800

This automatic antenna tuner is designed to operate with the FT-890 HF transceiver. The tuner is fully automatic and operations can be controlled from the front of the FT-890. **Suggested List $499.95**

FC-757AT

When this tuner is used with the FT-757GX or FT-757GXII, it obtains all band data directly from the radio. Front panel controls allow it to be used with other manufacturer's exciters. The tuner has a microprocessor, a built-in 50 ohm dummy load and automatic SWR calculating system, SWR meter, and dual range RF wattmeter. **Suggested List $530.95**

ICOM

Icom has six antenna tuners to use with their radios. All are automatic and, with the front panel controls, can be used with most HF exciters. Random wire and balanced line antennas cannot be used with the reasonant antenna tuners.

Reasonant Antenna Tuners

AT-150 / AT-160

Fully automatic 100 W tuners styled after the IC-735 and IC-728 respectively. **Suggested List Prices: AT-150 $539.95; AT-160 $442.95**

AT-100 / AT-500

Two tuners for base station use have a cabinet to match the IC-751A. The AT-100 will support 100 W while the AT-500 can be used with the 2KL HF linear. **Suggested List Prices: AT-100 $CALL; AT-500 $705.95**

Random Wire Tuners

AH3

This automatic tuner, designed to use with the IC-725 and IC-707, features automatic digital control tuning and eight frequency memories. Use with the optional AH-2b antenna element for mobile operation. **Suggested List $594.95**

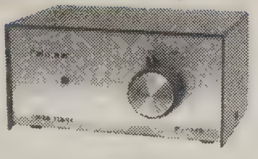
AH2A

This tuner includes a control unit for direct connection to the IC-735. Use with other Icom HF radios with the proper matching cable. Tunes back-stays on a sailboat. Has optional bumper mount and whip (AH2B). **Suggested List Prices: AH2A $691.95; AH2B $248.95**

3 KW Tuner MB-V-A

Match transmitter output impedance to almost any antenna system for maximum power transfer. Low pass Pi network tuning 1.8-30 MHz. Automatic SWR. Separate power meter, 300 or 3000 W. Push button antenna switch for 4 antennas. Includes 3 KW balun. The MB-V-A is a very high quality antenna tuner designed for the amateur who wants "the best." **Suggested List Price $791.95**

Palomar Engineers



Tuner-Tuner
PT-340

Help stamp out tune-up QRM (and save your finals at the same time). Just connect the Tuner-Tuner between the tuner and the rig. Tune the receiver to the frequency you want to operate. Turn on the Tuner-Tuner and adjust the antenna tuner until the noise drops out. The antenna tuner is now tuned to the desired operating frequency. **HRO Price $99.95**

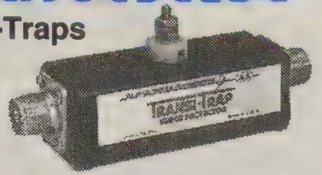
R-X Noise Bridge
RX-100

Do you know the resonant frequency of your antenna exactly? The R-X Noise Bridge tells you whether or not your antenna is resonant. If not, it tells you whether it is too long or too short. The RX-100 works with dipoles, inverted vees, quads, Yagi beams, multiband trap dipoles and verticles. Frequency range is 0 to 100 MHz On multiband trapped antennas, adjust each section so that the antenna works properly on each band. Use it to measure coax, tune your antenna tuner, test a balun and check tuned circuits. Since the RX-100 uses your receiver, it is much more accurate than a grid dip meter. **(Warning! Do not transmit into the RX-100. The unit will be damaged.)** HRO Price $79.95

Surge Protectors

ALPHA DELTA

Transi-Traps



Protect your rig from lightning, EMP and static. Transi-Traps are constructed of the finest quality materials; housings are of die cast aluminum; the brass element provides a constant impedance; the ceramic gas tube cartridge is protected by a unique custom-designed nylon shock absorber. The units give years of reliable service. When hit with a charge that exceeds its rating, it will short and indicate that a replacement plug is required. Most units take thousands of surges before needing a replacement.

Transi-Traps are designed for 50 ohms and include a replaceable cartridge. Units come with UHF connectors. Type "N" are available. To order replacement plugs, specify the model of Transi-Trap so the correct plug can be sent.

Model	Description	HRO Price
RT	200 W through 500 MHz	$32.95
HV	2 kW through 500 MHz	$35.95
LT	T type, 200 W through 30 MHz	$22.95

AMERITRON

Step-Start In-Rush Current Protector

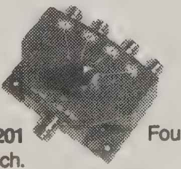
Stops in-rush current upon power up and absorbs momentary high voltage spikes to your amplifier. **ICP-120** for 110-120V or **ICP-240** for 220-240 VAC. **Suggested List $79.95**

Coax Switches

DAIWA

Daiwa has two heavy-duty coaxial switches. Both are useable to 500 MHz and the unused positions are grounded. Switches are also available at slightly higher prices with type "N" connectors.

CS-201
Two-position switch.
HRO Price $25.95

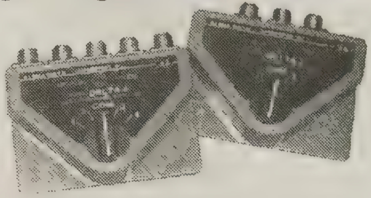


CS-401
Four-position switch.
HRO Price $129.95

Coax Switches

ALPHA DELTA

Lightning Protected Switches



Delta-4
4 Position Switch

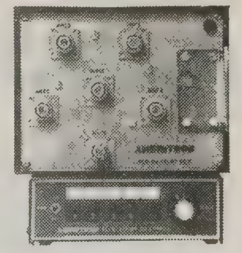
This lightning protected 4 position RF coax switch uses the Alpha Delta Arc-Plug cartridge to protect your equipment from electrical surges. It features the exclusive center "off" (ground) position which internally disconnects and grounds all antenna circuits. The Delta-4 has custom design cast housing with constant impedance micro-strip cavity construction for outstanding performance through UHF. The switch uses a positive detent roller bearing switch drive, handles full legal power and is made in the USA. Order the Delta-4/N for type "N" connectors. The Delta-4 handles frequencies through 500 MHz and the Delta-4/N through 1.3 GHz. **HRO Price $74.95; Type N $89.95**

Delta-2
2 Position Switch

This 2 position RF coax switch is precision lightning surge protected. It has the same constant impedance cavity construction with "center-off" ground as the Delta-4 and a built-in replaceable Arc-plug® cartridge. Order UHF or type "N" connectors for low-loss performance through 1.3 GHz. **HRO Price $49.95;** With "N" connectors **$64.95.**

Remote Coax Switches

AMERITRON



RCS-8V DC-UHF 5 kW Coax Switch. Replace 5 coax feedlines with just one with the Ameritron Coax Switch. Weatherproof box mounts outdoors on your tower or mast. Attractive control unit sits on your operating desk. Low SWR to 450 MHz. Low loss. Rated at 5 kW to 30 MHz, 1 kW to 150 MHz. **Suggested List $149.95**

RCS-4 4 position HF switch. Similar to RCS-8V. Requires no control cable. Handles 2500 watts PEP. **Suggested List $134.95**

QSK-5 Pin Diode T/R Switch. Self-contained. Connects externally to most HF amplifiers. Handles 2.5 kW PEP, 2 kW CW. Six times faster than vaccum relays. **Suggested List $349.95**

ACCESSORIES

Low Pass Filters

BENCHER, INC.

YA-1

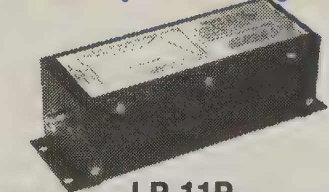
This low-pass filter has exceptional specifications. Working range: 1.8-29 MHz. Impedance: 50 ohms. Power rating: 1.5 KW continuous, 5 KW peak. Attenuation: at least 80 dB at 54 MHz. **HRO Price $49.95**

B&W

B&W manufacturers two low-pass filters. Each has a different power handling capability. Attenuation is 60 dB at 54 MHz.

Model	Power	Cut-Off	Price
FL-10 / 100	100 watts	30 MHz	$79.95
FL-10 / 1500	1500 watts	30 MHz	$41.95

Oak Bay Technologies



LP-11P
Low Pass Filter

The LP-11P is a commercial quality low-pass filter. It operates from 1.8-30 MHz with an 11 pole inverse Chebishev design. The upper cut-off frequency is 41 MHz with 80 db attenuation by 51 MHz. Maximum power is 1000 watts. **HRO Price $69.95**

Telephone Filters

K-COM

Telephone Interference Filters

Stop telephone RFI from transmitters in the 0.5 to 30 MHz range. The filters are fully assembled and instructions are included. There are two models:

Model RF-1 Single Line Filter for phones, answering machine, modems, fax and cordless phones. RJ-11 modular connectors. Can be special ordered for two-line phones.
HRO Price $16.95

Model RF-2 For inserting RFI filtering into telephone wiring: inside phone jacks, behind wall-mounted phones, etc. Solderless connectors.
HRO Price $10.95

Both models can be special ordered to cover 500kHz to 3.0 MHz. Call HRO for price and delivery information.

SPARREVOHN
Engineering

Telephone Filter

The **FONEFILTER** by Sparrevohn Engineering is designed for outstanding performance on standard single-line bell systems. Units are placed "in-line" as close as possible in series with the existing phone line using the RJ-11 jack. Works well to provide outstanding isolation. **HRO Price $16.95**

Encode / Decode

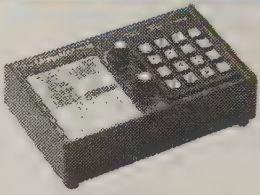
Communication Specialists

Control your repeater or listen only to those signals that are for you. Tone encoders and decoders from Communication Specialists are just the items you need.

	Tone Encoder	ToneDecoder	Comments	HRO Price
TS-32P	*	*	Universal design, CTCSS encoder/decoder capability for all FM transceivers	$57.95
SS-32PA	*		DIP switch programmable CTCSS encoder for all FM transceivers	$28.95
SS-32SMP	*		Micro-miniature CTCSS encoder for handhelds. Programming by solder jumpers.	$27.95
TE-64	*		Multi-purpose CTCSS/Burst Tone encoder	$79.95

AEA

Electronic Keyer



MM-3 Morse Machine

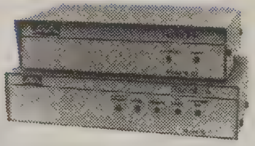
$189.95
HRO Price

Upgrade your license with the MM-3's five training modes: DX contest simulator, QSO simulator, proficiency trainer, random word generator and computer interface/8,000 character memory. Also the best fully programmable Memory and Contest Keyer available with auto serial numbering and several keying options.

KK-1
Keyboard Morse Machine

The KK-1 turns any standard PC-compatible 101-keyboard into a feature packed Morse machine. Short term memory, message repeat and nestable message buffers make the KK-1 versatile and easy to use. Speed selectable from keyboard or front panel knob. Also features a built-in iambic keyer and Farnsworth code practice. **HRO Price $189.95**

Remote Control



HamLink

Operate your ham station from anywhere in the world using a Touch Tone™ telephone. Control any function of a ham radio which can be controlled by a serial computer interface port. The HamLink™ sits beside of your rig and connects to the microphone, external speaker, CW key and serial port jacks of most current Icom, Kenwood, and Yaesu transceivers. (Check with HRO for exact details.) Connect it then to your phone line. Once the connection is made and your private access code is entered, you can control the computer-controllable frequency tuning of your transceiver. **HRO Price $219.95**

RadioLink

Use your handheld or mobile radio to access your HF station. RadioLink goes between your HF/VHF/UHF transceiver and a repeater or a 220 MHz or UHF full duplex link. You can then operate your station from a handheld or mobile radio. RadioLink allows you to set your transceiver on a specific frequency, tune to a frequency, set mode, access memories and scan. Standard cable is provided for you to directly plug into most VHF/UHF radios with an 8-pin microphone connector. **HRO Price $299.95**

Audio Enhancers

NRF-7
Filter / Noise Reducer

The NRF-7 Filter / Noise Reducer provides no-delay filters for AMTOR, PACTOR and break-in CW. The filter uses state-of-the-art Digital Signal Processing (DSP). This design permits sharp non-ringing CW and voice filters plus auto NOTCH and white noise reduction. It connects between the speaker output of your receiver or transceiver and an external speaker. **HRO Price $239.95**; AC Supply **HRO Price $16.95**

NIR-10
Noise & Interference Reducer

The NIR-10 Noise and Interference Reduction Unit now with NEW REVISION 3.0 software is designed for use at the audio output of a transceiver to enhance the quality of received voice and CW. The NIR-10 uses advanced Digital Signal Processing (DSP) techniques to recognize and improve the signal-to-noise ratio of SSB voice signals. Features are also available to enhance CW and RTTY signals. **HRO Price $349.95**; AC Supply **HRO Price $16.95**

NEW!

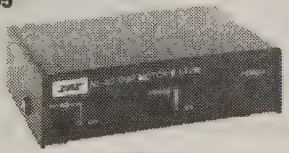
SSTV-1
DSP Filter for SSTV

The SSTV-1 is a specially designed filter for use with Slow Scan TV. It removes adjacent channel and in-band interference from SSTV signals. It clears up noisy and distorted SSTV pictures using digital signal processing. **HRO Price $159.95**

NEW!

NTR-1
Wide Band Noise / Tone Remover

The NTR-1 is a general purpose audio processing unit designed specifically to provide noise reduction and multiple tone removal for AM/FM or other wideband signals. It provides narrow band operation for SSB, CW or data reception. It operates on the receiver audio output and contains a built-in audio amplifier. **HRO Price $169.95**



NF-60
Notch Filter

The NF-60 DSP Spectral Notch Filter automatically removes MULTIPLE heterodynes, tune-ups or CW/RTTY tones in 5 msec. The NF-60's DSP filter algorithm provides as many extremely narrow notch filters as there are tones. Connects between your transceiver or receiver speaker jack and an external speaker. **HRO Price $155.95**; AC Supply **HRO Price $16.95**

Signal Processors

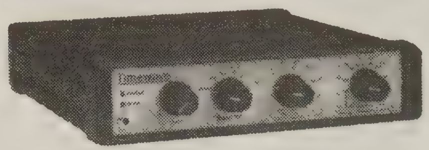
Timewave Technology Inc

NEW!

DSP-9+
Noise Filter

The DSP-9+ reduces and filters noise and interference to improve radio reception. The DSP-9+ uses digital signal processing technology to provide optimum filters for random noise reduction, heterodyne elimination and bandpass filtering.

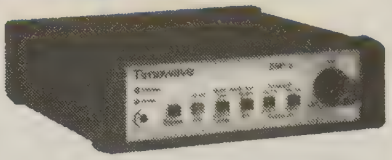
The DSP-9+ reduces noise and interference with adapative noise filter for SSB and AM. It eliminates heterodynes by using multiple automatic notch filters. Sharp speech, data and CW filters provide 1.8, 2.4 and 3.1 kHz bandpass well as 100, 200 and 500 Hz bandpass. This is perfect for RTTY, AMTOR, PACTOR, HF Packet and CW.. List $219.95



DSP-59
Digital Signal Processor

The DSP-59 reduces and filters noise and interference to improve radio reception. The DSP-59 uses digital signal processing technology to provide optimum filters for five base functions: 1) Random noise reduction; 2) Tone noise reduction; 3) Highpass filtering; 4) Low-pass filtering; 5) Bandpass filtering. The five functions are combined to make five switch selectable modes.

The DSP-59 is compatible with all amateur radio transceivers and receivers. Simply connect it between the radio and the speaker. Requires 12-16 VDC to operate (not provided). **Suggested List $299.95**



DSP-9
Digital Signal Processor

The DSP-9 reduces and filters noise and interference to improve radio reception. Its digital signal processing technology provides optimum filters for random noise reduction, heterodyne elimination, and bandpass filtering.

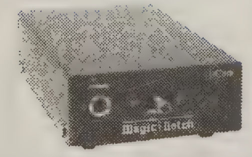
Noise reduction function examines a characteristic of signal and noise called correlation and dynamically filters out the undesired noise. Random noise such as white noise or static is uncorrelated. Speech is moderately correlated. Pure tones are highly correlated.

Narrow band signals like CW require bandpass filters with steep skirts and linear phase response. SSB signals often have a high signal-to-noise ratio but have interference from other signals that overlap the desired signal. The DSP-9 will support both requirements.

The DSP-9 operates with convenient front panel push buttons. The correct filter combinations can be selected for CW or SSB. The DSP-9 is compatible with all amateur radio transceivers and receivers. Simply connect it between the radio and the speaker. Requires 12-16 VDC to operate (not provided). **Suggested List $169.95**

Audio Filters

j•Com



Magic Notch

Automatic Notch Audio Filter

The Magic Notch removes all heterodynes caused by tuners, carriers, CW, computer RFI and similar QRM. It is fully automatic, no tuning required and tracks drifting carriers. It is easily installed between the rig and external speaker or headphones. **HRO Price $104.95**

Audio "Repeater"

j•Com

Save your voice in those 48 hour contests by using the Ventriloquist. It will send your call sign and contest exchange for you.

The audio memory holds four variable length messages for a total of 20 seconds of high fidelity audio storage. Each message can be played at any time by pressing one of the message keys. **Suggested List $149.95**

SWR & WATT METERS

Model 43
Directional Wattmeter

The low-cost Model 43 Thruline Directional Wattmeter has an unequaled history of reliability, durability and flexibility. It is a thoroughly engineered, portable, insertion-type instrument that measures both forward and reflected CW power in coaxial transmission lines. It gives accurate RF power flow readings under any load conditions.

Model 43 is comprised of a line section and a direct-reading 3 scale meter housed in a rugged, corrosion-resistant aluminum case. Quick Change (QC) type connectors and a full range of plug-in measuring elements are available. (See the chart for the most popular elements. Others are available on special order.) Two extra elements can be stored in the housing, one on each side.

The shock-mounted 30-microampere meter has 3 expanded scales of 25, 50 and 100 unit calibrations. It normally comes with type SO-239 QC connectors installed. Other popular connectors are available. Please specify at time of purchase.

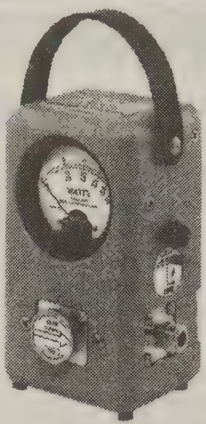
PEP Modification Kit
Model 4300-400

Your existing Bird 43 meter can be upgraded to a PEP reading meter. Order the 4300-400 modification kit. It is easy to install—procedures are included for most versions of the Model 43.

Accessories

The most popular wattmeter accessories are:

- CC-1 Meter case.
  Space for up to 6 elements.
- EC-1 Element case.
  Space for up to 12 elements.

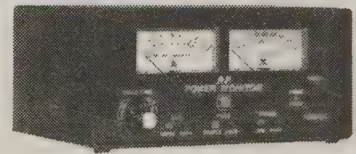


Model 43P Peak Reading Wattmeter

The Model 43P is a peak-reading version of the popular Model 43. The peak reading option has been installed in one of the spare element holes on the side of the meter.

The meter reads CW with the switch out and PEP when the switch is pushed in. Requires a 9 VDC battery. The frequency range and power levels are determined by the element used. No special elements are required. The meter comes with SO-239 QC connectors installed. Others are available.

RF Power Meter RFM-003 / 005



Flick a switch to measure peak or average power. Full-wave detection system shows true PEP output. Adjustable hold time captures peaks. Separate panel meter for fully automatic SWR indicator (.5 W - 5 kW). Separate calibrated remote sensors used to cover most all frequencies and power levels.

RFM003 reads 3 KW full scale.
Suggested List Price $375.95

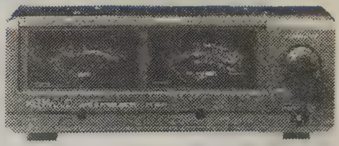
RFM005 reads 5 KW full scale.
Suggested List Price $395.95

Bird Standard Elements

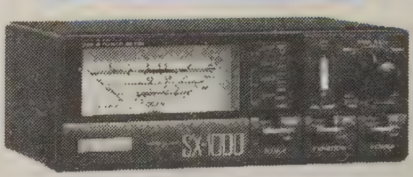
Power	2-30 MHz	25-50 MHz	50-125 MHz	100-250 MHz	200-500 MHz	400-1000 MHz
5 watts		5A	5B	5C	5D	5E
10 watts		10A	10B	10C	10D	10E
25 watts		25A	25B	25C	25D	25E
50 watts	50H	50A	50B	50C	50D	50E
100 watts	100H	100A	100B	100C	100D	100E
250 watts	250H	250A	250B	250C	250D	250E
500 watts	500H	500A	500B	500C	500D	500E
1000 watts	1000H	1000A	1000B	1000C	1000D	1000E
2500 watts	2500H		2500B	2500C		
5000 watts	5000H					
10000 watts	10000H					

SWR / Power Meters

SW-2100



The SW-2100 SWR / wattmeter features dual meters for monitoring of SWR and forward power. There are two ranges 0-200 W and 0-2000 W with a frequency range of 1.8 - 30 MHz. **Suggested List Price $164.95**



The Diamond RF SWR / wattmeters cover the complete range of amateur applications. The SX meters have the following features:

- Illuminated meters. Require 12 volts DC.
- Low insertion loss generally less than 0.2 dB in HF range and 0.3 dB at higher frequencies.
- Power measurement accuracy is generally ±10% on the higher power ranges and ±5% on lower ranges.
- Some have remote sensors for power pick-up.
- Low loss SO-239 connectors are used except for the high frequencies as noted in the table.
- Measurements are forward power, reflected power, SWR &, on selected frequencies, PEP monitor.

Model	Freq MHz	Power Ranges	Connectors	HRO Price
SX-100	1.6-60	30/300/3KW	SO-239	$139.95
SX-200	1.8-200	5/20/200	SO-239	$99.95
SX-400	140-525	5/20/200	SO-239	$119.95
SX-600	1.8-160 140-525	5/20/200	SO-239	$189.95
SX-1000	1.8-160 430-450 800-930 1230-1300	5/20/200	SO-239 N N N	$239.95
SX-9000	4 Band Automatic See SX-1000	5/20/200	Same as SX-1000	$274.95

Model	Description	HRO Price
NS-660A	1.8 - 150 MHz	$189.95
CN-410M	3.5 - 150 MHz	$99.95
CN-465M	140 - 450 MHz	$99.95
NS-663BM/BN	144 - 525 MHz	$199.95
DP-810	1.8 - 150 MHz	$249.95
DP-820N	140 - 525 MHz	$279.95

Frequency Counters

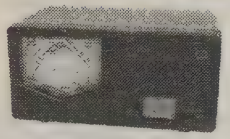
Startek International

Startek's ATH™ series brings you auto trigger and hold in a pocket sized frequency counter. Super fast circuitry reads and holds a signal in less than one-tenth of a second. **Call for HRO quotes.**

Model	Description	List Price
ATH15	1-1500 MHz, High speed	$235.95
ATH30	1-2800 MHz, High speed w/ ATH built in	$299.95
ATH50	ATH-30 plus Hi-Z input 5 Hz to 48 MHz	$339.95
1350	1-1300 MHz, 3 gate times	$129.95
3500	10 Hz-3500 MHz, wide frequency range	$249.95
15-BG	1-1500 MHz, High sensivity w/ bargraph	$169.95

SWR Meters

DAIWA

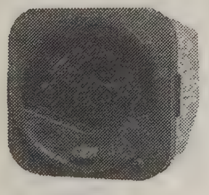


CN-101

Features:

- Large cross needle meter
- Forward / reverse read simultaneously
- PEP monitor function

	CN-101
Frequency	1.8 - 150 MHz
Power Range	15/150/1.5 KW
Power Rating	1.5 KW(1.8-60MHz 1 KW (144 MHz)
SWR Detection	4 W minimum
HRO Price	$89.95

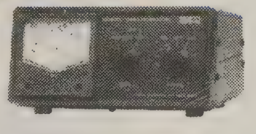


CN-460M

Features:

- Compact
- Cross Needle Meter
- Mobile / Base Use

	CN-460M
Frequency	140 - 450MHz
Power Range	15/150 W
Power Rating	150W
SWR Detection	3W minimum
HRO Prices	$99.95

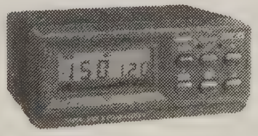


NS-660PA

Features:

- Cross needle meter
- PEP and RMS readings
- Remote sensors available

	NS-660PA
Frequency	1.8 - 150 MHz
Power Range	30/300/3 KW
Power Rating	3. KW
SWR Detection	8W minimum
Sugg. List	$229.95



DP-800 Series

Features:

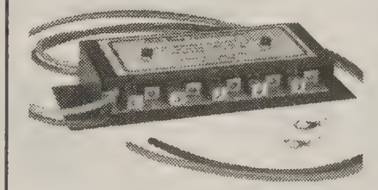
- Large LCD display
- RMS and PEP readings
- Bargraph display
- Audible Beeps

	DP-830
Frequency	1.8 - 150 MHz 140-525 MHz
Power Range	0 - 1.5 kw 0 - 150 MHz
Power Rating	1.5 KW 150 W
Sugg. List	$385.95

Oak Bay Technologies

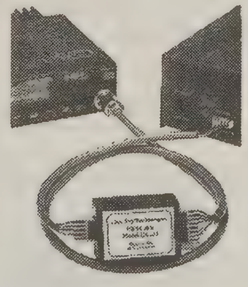
AM-101B Rubber Duck Mount

The perfect temporary antenna mount for emergencies, rental cars or vacations. It is made of stainless steel and has 15 watt power capability. Just slip over your window glass and attach your handheld antenna to the BNC connector. 6 feet of RG-174U coax provided. **HRO Price $24.95**



PS-101 High Current Power Strip

This high current 12 VDC power strip for the ham shack has heavy-duty steel housing construction with current handling up to 50 amps. It has 5 fused outlets, 2-30 amp and 3-20 amp. It is perfect for HF radios or those high power VHF / UHF amplifiers. **HRO Price $79.95**



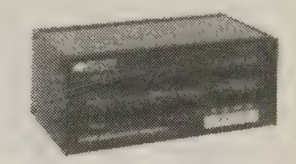
CA-232-U Universal Packet Cable

UNI-Cable™ provides interface between all popular TNCs and all popular VHF/HF transceivers. No soldering is required. It can be easily programmed by the user for 8 PIN microphone connectors. **HRO Price $34.95**

FALCON COMMUNICATIONS

F121A Portable Antenna

The ideal portable VHF / UHF antenna for FM handhelds and scanners is the F121A. It retracts to only 8.7 inches for carrying, yet extends into a full size ground independent half-wave dipole for 2 meters, 222 MHz, 70 cm and all frequencies in between. Band markers eliminate measuring. Includes a chart for non-ham frequencies. Mount vertically or horizontally. The F121A comes ready to use with pre-installed 6 foot 50 ohm cable and BNC connector. **HRO Price $29.95**

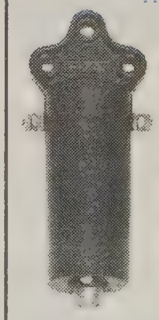


F251A / F252A Amps

Falcon has two audio distribution amplifiers, the F251A (single amplifier) and F252A (dual amplifiers). This is the quick and easy way to switch audio from up to 7 rigs or other audio sources to a number of speakers. They combine outputs from several transceivers to a master station speaker, to audio filters, or TNCs. Inputs are highly isolated by the internal amplifier providing a constant 10 ohm impedance. Requires optional 13.8 VDC power. **HRO Price F251A $54.95; F252A $84.95**

Balun

BENCHER, INC.



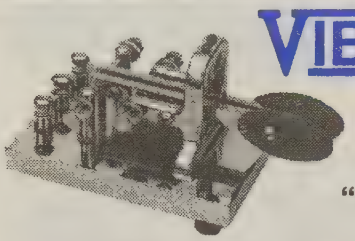
ZA-1A Balun

The ideal 1:1 Balun for dipoles, inverted vees, quads and yagis from 80 - 10 meters. Lets your antenna radiate, not your feed line. Accepts 1/4" support rope for inverted vees, etc.

No rusting materials used. No ferrite cores to saturate and cause TVI. Rated 5KW peak. DC grounded for lightning protection. Included "O" ring seals coax connector. A tough, well-made product, carefully engineered, for years of reliable service. **HRO Price $29.95**

VIBROPLEX®

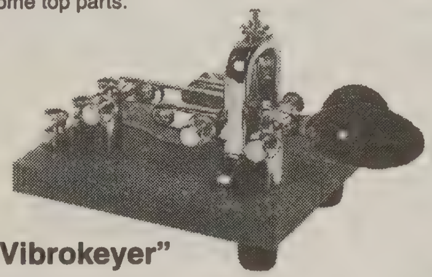
Call for Quotes



"Iambic"

The Iambic paddle is offered in response to many requests from operators to bring the Vibroplex tradition to modern telegraphy. Although traditional Vibroplex design, it is a modern Iambic paddle.

There are three models: **Iambic Presentation**: 24K gold plated brass plate on a polished chrome base with bright chrome top parts. Silky smooth movements are jeweled as in fine Swiss watches. **Iambic Deluxe**: Same as Presentation but without the 24K gold plated brass plate. **Iambic Standard:** A neat textured-finish gray base with chrome top parts.



"Vibrokeyer"

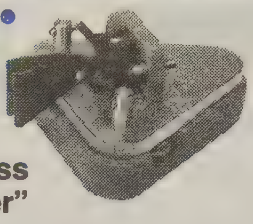
The Vibroplex Vibrokeyer is designed for "Bug" operators who want to move to electronic keyers without relearning keying. The single lever paddle imitiates the automatic dots and dashes of the electronic keyer with the same motion used to operate the "Bug." It uses the same main frame and chrome parts as the "Original" for the same smooth and easy operating Vibroplex feel. For those who want to combine traditional skill with modern electronics.

Available in two models. **Vibrokeyer Deluxe:** Highly polished chrome base with bright chrome top parts. Silky smooth movements are jeweled as in fine Swiss watches. **Vibrokeyer Standard**: A neat, crisp textured finish gray base with bright chrome parts.

"Original"

The Vibroplex "Original" design, with little modification, is made today by the same company using the same tools and dies as always. Modern-day operators can put their fist to the same equipment as the Western Union and railroad operators of old. The distinctive sound of the "Bug" can still be heard—the signature of a true CW expert.

Available in three models. **Original Presentation**: 24K gold-plated brass plate on a highly polished chrome base with bright chrome top parts. Its silky smooth jeweled movements are the same as those used in fine Swiss watches. **Original Deluxe**: Same as the Presentation but without the 24K gold plated brass plate. **Original Standard**: A neat, crisp textured finish gray base with bright chrome top parts.



"Brass Racer"

The Vibroplex Brass Racer EK-1 is also a keyer. Concealed in the base is a fully iambic, dot-dash-inserting, and adjustable speed control keyer using the Curtis 8044 chip. Vibroplex quality and pride throughout. A great unit for mobile or DXpedition. The Vibroplex Brass Racer--Iambic is a new design of the iambic paddle; crafted from solid brass and mounted on a base of polished hardwood. The paddle tension can be customized to the operator's precise feel with a single twist of our unique tensioning system. No screws, no springs.

Available in two models: **Brass Racer EK-1**: Same as Brass Racer Iambic but includes a built-in electronic Iambic keyer. **Sugg. List $149.95**
Brass Racer Iambic: Solid lacquered brass mounted on a hardwood base. **Sugg. List $65.95**

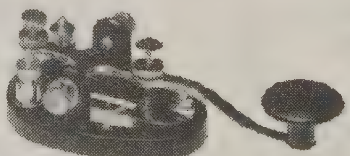
Nye Viking

Code Practice Set 404-002

Perfect for the beginner. Nye Viking standard key oscillator with amp and built-in 2" speaker on a base with non-skid feet. Gives chirp-free keying. **HRO Price $49.95**

Master Key 330-001

The perfect straight key comes with cord and plug. Isolated contact assembly separates keying circuit from hardware. Includes gold-plated silver contacts, adjustable key arm, Navy knob, and heavy die-cast base. **HRO Price $59.95**

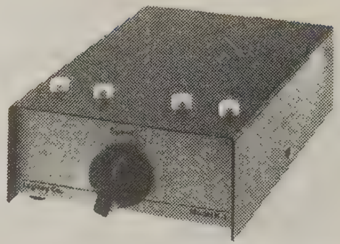


Speed-X Straight Keys

Keys with gold-plated heavy silver contacts, adjustable key action, and heavy die-cast bases. Brass or nickel-plated hardware, standard or Navy knobs.

Logikey

K-1 Keyer

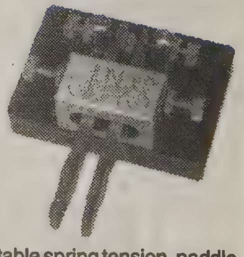


The K-1 has four simple-to-load message memories. Each holds 48 characters such as "The quick brown fox jumped over the lazy dog's back." Messages may be tied together, may call other memories and loop for beacon functions. Automatic serial number generation is easy, while serial number decrements are done by simply pressing the middle two buttons. If you err in loading a message, send a string of 7 or more dits to erase the last word sent. Word and letter spacing is easily customized. **Suggested List Price $129.95**

K-1 Features include:
- Linear speed control. Range 6-60 WPM.
- Weighting control, 25-75%.
- Fully iambic, dot and dash memories.
- Four memories of 48 characters each.
- Messages may have embedded functions.
- Message loop capability.
- Input Queuing for multiple memory calls.
- Multi-format serial numbers to 9999.
- Instant serial number decrements.
- Selectable auto spacing.
- Memories can allow paddle insertion.
- Corrects transmitter keying characteristics.
- Built in monitor, speaker, tune function.
- Superb user friendly instruction manual.
- Provision for remote switches.
- Keys positive or negative lines.
- Requires 12 VDC. Built in back up battery.

Accessories: **KB-1**, push button bracket to use on a Bencher paddle; **HK-1**, hook-up kit.

Palomar Engineers



Precision made by Jones of England. Imported by Palomar. Smooth solid iambic action by rotary ball bearings enclosed in machined brass block on steel base. 3-1/2 pound total weight. Adjustable spring tension, paddle height and paddle spacing. Gold plated contacts. Engraved serial number.

PK-200 Brass mechanism with red steel base	$145.95
PK-200B All Brass	$170.95
PK-200G Gold plated (base & mechanism)	$299.95

PHONE PATCHES

BENCHER, INC.

BY Series

You will enjoy using Bencher's smooth-acting paddles with iambic keyers. They are mounted on heavy bases, have silver contact points, non-skid feet, stainless steel adjustable spring for different fists, nylon and stainless self-adjusting needle bearings, stainless fasteners and large clear plastic handles.

HRO Prices for Iambic models:

BY-1	**Black**	**$72.95**
BY-2	**Chrome**	**$89.95**
BY-3	**Gold**	**$219.95**
BY-4	**Gold/Blk**	**$149.95**

RJ Series

For nearly twenty years, Bencher has been the market leader in keyer paddles for flawless code. Now Bencher introduces a hand key that is destined to be the new standard in its class.

The Bencher model "RJ" series of hand keys features an advanced American-style design derived from the telegraph keys that won the west, yet with modern features that old timers would have killed for. Like Oilite bearings, a solid Navy knob, gold-plated solid silver contacts, full locking adjustments of all tension and spacing parameters, and quality materials through out—Bencher quality!

These keys are ideal for the new amateur just mastering the code as well as the old time brass pounder anxious to "clear the hook." This key offers the Morse code operator an investment that will bring years of pride and satisfaction.

Ask to see the Bencher "RJ" hand key at your favorite HRO location. Send your call, or a snappy "CQ." You will be immediately convinced that there is not a better key available.

HRO Prices:	**RJ-1**	**Black**	**$69.95**
	RJ-2	**Chrome**	**$79.95**

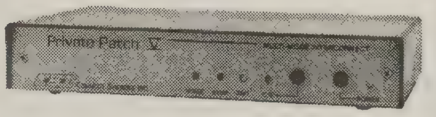
ST Series

The ST single lever paddles are for 'bug' users.

HRO Prices:	**ST-1**	**Black**	**$72.95**
	ST-2	**Chrome**	**$89.95**

CSI

Connect Systems Inc. has been producing the finest interconnect products available for more than ten years. These microprocessor-based products offer many features unavailable from any other manufacturer. Compare carefully and your choice will be clear.



Private Patch V
(VHF / UHF)

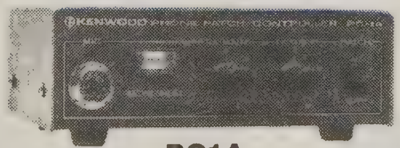
Private Patch V is the only simplex patch available that can turn your base station radio into a mobile phone system without any internal connections to your radio. Simply connect to the mike and speaker jacks. Private Patch V can be used straight simplex or through remotely located repeaters to extend range. Other modes t0 be selected using the built-in programming keyboard (and companion display) include vox enhanced sampling, half duplex and repeater controller. Private Patch V is loaded with high-end features such as 90 memory speed-dialer, redial, pulse or regenerated tone dialing, automatic disconnect on busy signals and dial tone, toll restrict, secret toll override code, ringout on 1-9 ring, remote base mode, call waiting/ line-in-use detect, CW ID and more. Fully FCC and DOC approved. **Suggested List Price $533.95**

YAESU

SP-767P

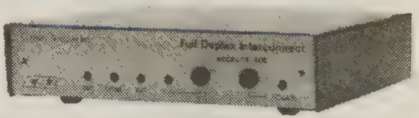
The SP-767P is the phone patch version of the popular SP-767 speaker. Cables are provided for connection to the current line of Yaesu HF radios. It does not include the audio filters of the SP-767 speaker. **Suggested List Price $136.95**

KENWOOD



PC1A

This phone patch is compatible with the Kenwood radio line and comes with an 8-wire cable for direct connection to the radio mike plug. The PC1A is FCC part 68 registered. Wired for Kenwood radios but may be used with others after proper changes in the connections. **Suggested List Price $124.95**



Full Duplex Interconnect Repeater Maker
CS—800

This low-cost fully-automatic full-duplex autopatch will convert your duplex dual-band base and mobile / HT into a mobile telephone system. The built-in repeater maker will also repeat crossband if desired. Or, connect the CS-800 to your existing repeater to add autopatch. Initiate and receive telephone calls without assistance. A two transformer hybrid gives optimum duplex null. All features are user programmable / selectable using the built-in keyboard and digital readout display. User programmable features include: 9 phone number speed dialer, Morse ID, toll restrict, access code, toll override access code, regenerated tone or pulse dialing, courtesy beep, repeater on / off code, hangtime and more. **Suggested List Price $349.95**

Intelligent Interconnect

Simplex Interconnect
CS-700

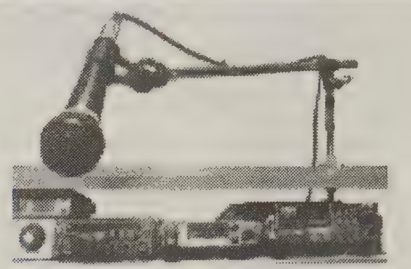
This low-cost fully-automatic simplex autopatch will convert an FM simplex base and mobile / HT into a mobile telephone system. Initiate and receive telephone calls without assistance. The CS-700 gives complete control to the mobile user. Select either VOX enhanced sampling or VOX controlled sampling with the built-in keyboard and digital readout display. Additional user-programmable features: 9 phone number speed dialer, Morse ID, toll restrict, access code, toll override access code, regenerated tone or pulse dialing, courtesy beep and more. **Suggested List Price $329.95**

Simplex Patch
CS-900

The CS-900 is voice activated and can be used simplex or through any remotely located repeater. The standard 1/2 second Electronic Voice Delay totally eliminates syllable or word clipping and results in unsurpassed simplex performance. A 90-memory speed-dialer and remote base mode are also included. The only required connections are to the mike and speaker jacks of your simplex transceiver. This is the best deal going in a simplex patch. **Suggested List Price $379.95**

MICROPHONES

HEIL SOUND



Headset / Boom Mike

BM-10

The Heil BM-10 is a boom mike / headset developed especially for the amateur operator. It weighs only 8 oz and the earpieces are soft and comfortable. The BM-10 can be ordered with either the HC-4 or HC-5 mike element and wired for Icom, Kenwood or Yaesu. Please specify.

Model	Wiring	Element	HRO Price
BM-10 K4	Kenwood	HC-4	$85.95
BM-10 K5	Kenwood	HC-5	$85.95
BM-10 I4	Icom	HC-4	$85.95
BM-10 I5	Icom	HC-5	$85.95
BM-10 Y4	Yaesu	HC-4	$85.95
BM-10 Y5	Yaesu	HC-5	$85.95
FS-1	Foot Switch		$24.95

Microphone Elements

HC-4 / HC-5

Heil Sound has two replacement microphone elements designed for amateur operators. The **HC-4** was designed for serious DX and contest operators. With a 10 dB peak at 2,000 Hz and the low rolled off sharply at 500 Hz, this is best for getting through the pile ups. The **HC-5** has higher fidelity and is the recommended element for the Icom SM-5/6. The output level matches that required for the Kenwood and Yaesu HF radios.

HRO Prices: HC-4 $28.95; HC-5 $28.95

HM-10 Series

By carefully selecting the correct hardware, you are now able to design the EXACT audio set up for your station. Using the new hardware from Heil, you can clamp it, screw it, bolt in or hold the great new Heil microphone, the **HM-10.** The components of the system are shown below. They are available prewired for Kenwood, Yaesu and Icom. Please specify the radio with your order.

Model	Description	Sugg. List
HM-10 (4)	Mike with case and HC-4 element	$85.95
HM-10 (5)	Mike with case and HC-5 element	$85.95
HM-10 Dual	Mike with both HC-4 and HC-5	$131.95
MA-1	Adjustable Boom	$49.95
FS-1	Foot Switch	$24.95
TB-1	Table Base Mount	$12.95

Headset

PRO-SET

Heil's newest headset for the amateur provides comfort and performance. Available for Icom, Kenwood and Yaesu. Contact HRO for specifications.

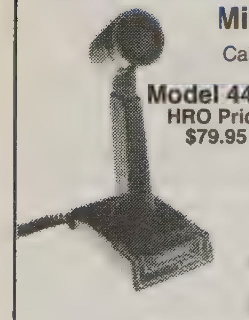
Suggested List Price $135.95

Desk Microphones

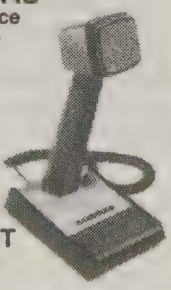
SHURE®

Quality Microphones

Call HRO for details...

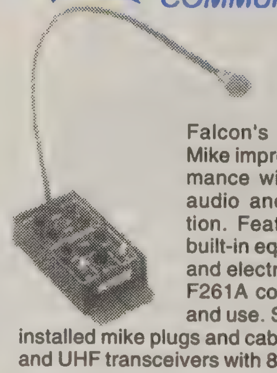


Model 444D
HRO Price
$79.95



Model 526T
HRO Price
$109.95

FALCON COMMUNICATIONS



F261A

Falcon's Dual Channel Desk Mike improves your rig's performance with clean transmitted audio and convenient operation. Features dual channels, built-in equalizers, built-in VOX and electret mike element. The F261A comes ready to plug in and use. Supplied with two preinstalled mike plugs and cables that fit all HF, VHF and UHF transceivers with 8-pin mike connectors. Requires 4-1.5v cells or 6-25 VDC external supply (not supplied). **HRO Price $99.95**

OUTbacker®

The Ultimate All-Band HF Mobile Antennas

The Perth

The *Perth* is comprised of a 4 foot main shaft where the taps are located, and a 3-1/2 foot sleek stinger. The Perth is constructed of a very tough yet flexible fiberglass core. This core is helically wound with copper wire which is hand tuned to the various "tap" frequency points.

The *Perth* offers high performance, with low wind drag. This low wind resistance allows the *Perth* to be easily mounted on the trunk lip, hatches, and bumper installations with a standard 3/8 X 24 stud. The sleek stinger retracts into the main shaft for easy stowage. With a proper ground plane, the *Perth* is also suitable for apartment and condo installations.

Outbacker

There is no need to ever change coils to change HF bands for mobile operation. The Outbacker™ is the answer for every ham who wants to operate mobile. The antenna comes in two models: a six foot long version that handles up to 300 watts PEP and a four foot Junior model for up to 150 watts PEP.

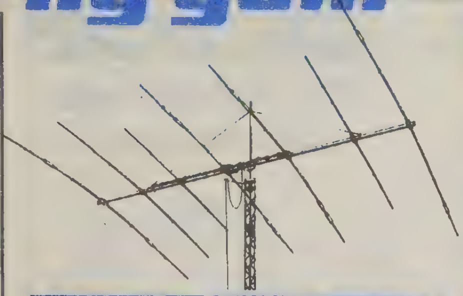
The antennas are constructed of fiberglass and coated with a smooth epoxy resin and polyurethane to provide strength, protection and durability. There is a pretuned copper helical winding with connection point sockets constructed of rust-free brass and clearly marked for each band. The antenna covers all bands from 10 to 80 meters.

The antenna mounts using a standard 3/8 X 24 thread. Use the Hustler BM-1 or SSM ball mounts for installation. For ease of mounting there is an optional heavy duty spring and 2 inch base that can be mounted at the bottom of the antenna and attached to a PL-259 connector.

HRO stocks the Perth, three models of the Outbacker™ and the optional spring base:

Model	Description	HRO Price
Perth	150 watts PEP all bands	$269.95
OB	Full size antenna, all bands, 300 watts PEP	$259.95
OB-JR	Jr. size antenna, all bands, 150 watts PEP	$229.95
OB-SB	Optional Heavy-Duty Spring and Base	$79.95

HF ANTENNAS



HF Beams

TH11DXS (398S)

The **TH11DXs** is a 5 band beam antenna for 10, 12, 15, 17 and 20 meters. It handles maximum legal power continuous duty without degradation. The driven elements are a log bay design with monoband reflectors and trapped directors for excellent front to back ratios. The BN4000B balun is recommended with this antenna.
Suggested list Price $1244.95

TH7DX (391S)

The TH7DX is a dual driven element tri-band beam for 10, 15 and 20 m. The 7 element antenna with its 24 foot boom maintains a VSWR of 2:1 or less on all bands including all of 10 meters. A unique combination of trapped and monoband parasitic elements produces a front-to-back ratio of 27 dB. The high efficiency traps are capable of full legal power. Stainless hardware used for all electrical and most mechanical connections. The antenna comes with a BN-86 balun.
Suggested List Price $936.00

Explorer 14 (395S)

The Explorer 14 uses Hy-Gain's Para-Sleeve concept to optimize edge-to-edge bandwidth on 10, 15 and 20 meters. The antenna handles maximum legal power and has a VSWR of less than 2:1. It has a turning radius of just over 17 feet and can be mounted on a roof tripod, mast, or medium duty tower. Constructed with stainless steel hardware. Includes a BN-86 balun.
Suggested List Price $605.95

Monobanders

Long Johns

HyGain's Long Johns are competition-grade five-element monoband antennas for 10, 15, or 20 meters. They are built of high quality aluminum and have stainless steel hardware.
105BAS (List Price $283.95) for 10m.
155CA (List Price $430.95) for 15m.
205CA (List Price $762.00 for 20m.

Other Monobanders

204BAS (394S)

This antenna provides 4 elements on 20 meters. It uses Beta match and provides 10 dB gain. Stainless steel hardware is included. Requires a BN-86balun. **Suggested List Price $555.95**

153BAS (236S)

This antenna provides 3 elements on 15 meters on a 12' boom. Uses the Beta match feed system and includes stainless steel hardware. Requires a BN-86 balun. Comes with directions for use on 24 m. **Suggested List Price $205.00**

103BAS (239S-1)

The perfect antenna for limited space 10 meter operation and for the Novice. The three elements are on an 8.5' boom. Uses the Hy-Gain Beta match system and includes stainless steel hardware. Requires a BN-86 balun.
Suggested List Price $144.94

Accessories

BN-4000 Series Baluns (243S) These are new current-type baluns. There are three models. BN-4000B for beams; BN-4000D for dipoles; BN-4000N with a type-N connector, frequency 1 to 54 MHz for beams. Call for HRO Discount Prices.
BN-86 Balun (242S) Broadband 50 ohm ferrite, voltage-type balun. Usable from 3-30 MHz. Comes with clamp to bolt to boom and SO-239 connector. **HRO Price $34.95**
CI Center Insulator (157S) For dipole antennas. Accepts 1/4" or 3/8" coax. **HRO Price $26.95**
EI End Insulator (156)For multiband dipoles. Pair of 7" heavily serrated end insulators. **HRO Price $9.95**

HF Vertical

DX-88 (188S)

Suggested List Price $300.00

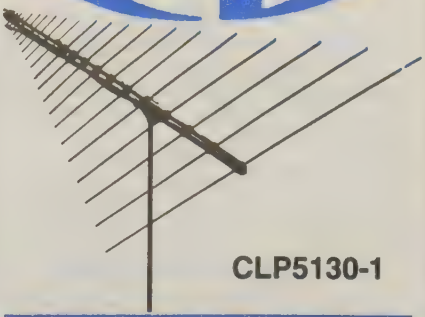
The exceptional vertical design of HyGain's DX-88 covers 10 to 80 meters including the WARC bands. It uses the entire antenna on both 80 and 40 meters for high efficiency radiation. Without lowering, the antenna can be accurately tuned from the ground to any point on the 80 or 40 meter band for convenient frequency adjusting.

The other six bands adjust to any frequency without affecting the tuning of any other band. Adjustable capacitors eliminate the need to stretch or compress coils so the tuned frequency is always known. The DX-88 is also tunable for 75 meter MARS use. An optional 160 meter add-on kit is available (Model No. 191S). The DX-88 is a superb dedicated SWL antenna covering 12 bands from 11-90 meters.

The antenna handles maximum legal power on all bands, features unique low-loss traps, and is broadbanded with VSWR of less than 2:1 on six of the eight bands. A low angle of radiation virtually ensures good DX performance.

The self-supporting DX-88 comes with stainless steel hardware. Enclosed trap coils are made of heavy gauge #12 solid copper wire wound on specially tooled forms for high accuracy and reduced loading changes due to weather.

The antenna requires ground radials of only 14 feet for efficient operation in a small area. Optional radial kits: Ground No. 189S for ground, No. 190S for roof. 160m kit is No. 191S.



CLP5130-1

Log Periodic Antennas

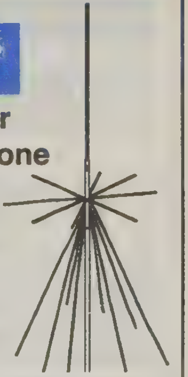
The **CLP5130-1** is a high gain, wide band VHF/UHF log periodic beam antenna for horizontally polarized base station use. It is suitable for amateur bands from 50 - 1300 MHz and FM broadcasting, scanning, VHF / UHF TV, air band communications, government application, and business band use.

The forward gain is 10 to 12 dB—10 to 16 times the gain of a nondirectional discone type antenna. The VSWR is less than 2.0:1 across the band.

The antenna, constructed from high quality aluminum, has a boom design that allows movement of the phasing line. Distortions in the vertical and horizontal planes are minimized and element adjustment is not necessary. The boom-to-mast bracket is made of a lightweight and rugged magnesium alloy.

	CLP5130-1	CLP5130-2
Frequency	50-1300 MHz	108-1300 MH
No. Elements	23	19
Power	500W PEP	500W PEP
Forward Gain	10-12 dBi	10-12 dBi
Front/Back	15 db	15 db
Longest elemen	9' 10"	4' 6"
Boom length	5' 9"	4' 6"
List Price	$379.95	$259.95

D-130J Super Wideband Discone



Monitor 25-1300 MHz. Transmit on 50, 144, 430, 1200 MHz. All stainless steel. Input power 200 watts. Impedance: 50 ohms. VSWR: 1.5:1. Length: 1.7 meters. Mounts on 1" to 2" masts.
HRO Price $94.95

KLM

HF Antennas

KT-34A / KT-34XA

The KT-34A and KT-34XA are pacesetters for triband performance. The four element KT-34A offers an unusually compact solution for a three-band high performance installation. The six element KT-34XA outperforms all other commercially available tribanders. The performance of these antennas comes from the application of lossless linear loading and high-Q air capacitors.

Monobanders

"World Class Extra" antennas are designed to satisfy the serious DX operator. The **80M-3**, **40M-4** and the 20 m, 15 m and 10m 6-element monobanders offer the ultimate in performance with no compromises. They are designed to achieve maximum gain, bandwidth and front-to-back ratios. All World Class Extra antennas use nonresonant Phillystran cable for element and boom-support.

160m Vertical

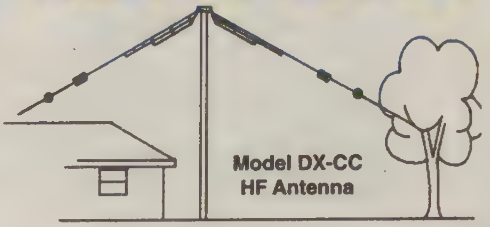
160V is center load for 160m. Use with ground or radials. A compact solution to your 160m needs.

HF Log Periodic Antennas

KLM's Log Periodics offer extended coverage of the amateur bands. The 10-30-7LPA covers 20,15 and 10m plus the WARC bands. The addition of a 40M-1 dipole provides 40m as well and the antenna is the 7.2/10-30-7LPA. For continuous coverage from 6-30 MHz use the 6-30-15LPA. The 6-12-8LPA covers 6-12 MHz.

Call Toll-Free for HRO's KLM Prices

ALPHA DELTA



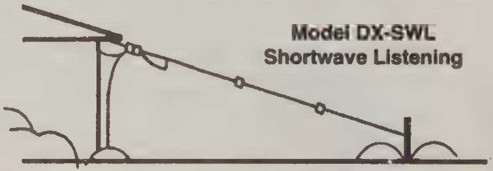
Model DX-CC
HF Antenna

Alpha Delta makes an assortment of limited space antennas. These all include stainless steel hardware where required, are fully assembled and are manufacturered to withstand severe weather. All antennas have SO-239 connectors.

Model DX-A - A quarter wave twin sloper for 160-80-40 meters. One leg is 67' and the other 55'. Installs as an inverted-V. **HRO Price $59.95**
Model DX-CC - A no trap 80-40-20-15-10 meter dipole. 82' long. **HRO Price $99.95**
Model DX-DD - A no trap 80-40 meter dipole. 82' long. **HRO Price $79.95**
Model DX-EE - A no trap 40-20-15-10 meter dipole. Only 40' long. **HRO Price $89.95**

DX-B

The **DX-B** is a single wire, high performance quarter wave sloper antenna for 160, 80, 40 and 30 meters. Designed for limited space, the antenna requires only 60 feet for installation and should be used with a wide range antenna tuner. It comes pre-assembled and pre-tuned. It utilizes stainless steel hardware, 12 gauge insulated solid copper wire and the Alpha Delta "iso-res" RF choke coils for efficient, 50 ohm coax feed. The DX-B is rated for full legal power. **HRO Price $69.95**

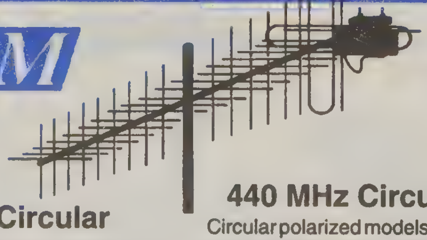


Model DX-SWL
Shortwave Listening

The **DX-SWL** model is the antenna tuned for the most popular SWL bands (13, 16, 18, 19, 21, 25, 31, 41, 49, 90 and 120 meters). It can be used as a multi-band transmit antenna with the appropriate antenna tuner. Overall length is 60 feet. Requires a single support. Uses standard coax to connect antenna to your radio. Feed point is 50 ohms and is an SO-239 connection. **HRO Price $69.95**

Oscar Antennas

KLM



2m Circular

Circular polarized models for 2m: **2M-14C** and **2M-22C**. Excellent for Oscar. Circular polarity switch included with each antenna.

440 MHz Circular

Circular polarized models for 440 MHz: **435-18C** and **435-40CX**. Excellent for Oscar. Circular polarity switch included with each antenna.

Fiberglass Masts

To provide proper horizontal boom insulation for OSCAR operation, KLM has two fiberglass masts: one 5 feet; the other 7.5 feet. Care should be taken in selecting the elevation rotator. The masts are too large for the Alliance U110 which is sometimes used. The masts will work with the Yaesu rotators.

VHF / UHF Antennas

The Forbes Group

Ventenna™

Can you spot the antenna?

Neither can your neighbors. At last a solution to antenna restrictions. The Ventenna™ quickly slips over your existing vent pipe and your signal really gets out! It is nearly invisible and is one of the most rugged antennas made.

The **VT-27** dual-band antenna is for 2 meters and 440 MHz. There are also single band models for 2 meters, 220 MHz and 440 MHz.

Model	Description	HRO Price
VT-14	2 meters	$49.95
VT-22	220 MHz	$49.95
VT-44	440-450 MHz	$49.95
VT-27	2 meter / 440 MHz	$74.95

Swiech
Communications Systems

3 Element Beam For 2 Meters

The **COY2M3EL** is a black anodized, light weight 3 element beam antenna for 2 meters. It provides a 6.1 dB forward gain and an H-Plane beamwidth of 80 degrees. The bandwidth is 144-148 MHz with an SWR < 1.7 at the band edges. Impedance is 50 ohms and it handles 200 watts. A great antenna for packet, public service, camping, T-hunting, Field Day or any portable operation. **HRO Price $64.95**

Also available are the
COY2M4EL: HRO Price $74.95
COY1.2 Beam: HRO Price $109.95

KLM

2-Meter Beams

Models 2M-16LBX, 2M-11 and 2M-4X.

440 MHz Beams

Models 440-27, 432-16BA, 432-30LBX, 440-14, and 440-6.

BUTTERNUT

Multi-band HF Verticals

HF2V

A self supporting vertical antenna for 40 and 80 meters. Features full automatic band switching using the Differential Reactance Tuning system. Accessory coils are available for 20 or 160 meters.

HF6VX

Model HF6VX offers greater VSWR bandwidth, greater radiation at the lower wave angles than comparable antennas, and higher radiation resistance than trapped verticals. Unique design uses three reactance- generating L-C circuits instead of traps.

Accessories for HF6VX

A-17-12 18 and 24 MHz (17-12 Meter) WARC band adapters with full automatic band switching for Butternut 5 and 6 band verticals. **HRO Price $49.95**

TBR-160-S 160 meter adapter attaches to the base of Butternut HF2V and HF6V verticals for automatic band switching 160 through 10 meters. Results in slight reduction in 80 / 75m bandwidth. Rated at 500 watts. **HRO Price $69.95**

STR-II Stub-tuned Radial Kit. Four radials for 40, 20, 15, and 10 meters, each 30 feet long and completely assembled with end insulators. Also includes coil of No. 16 copper-clad steel wire and insulators for four 30 meter radials and one 75 / 80 meter radial. **HRO Price $49.95**

RMK-II Roof Mounting Kit for Butternut verticals. Includes 2-foot tripod tower, STR-II radial kit, mounting post sleeve, plated lag screws, and complete instructions. May be used on any brand of HF verticals.
HRO Price $69.95

CPK Counterpoise for the HF6V, HF6VX and HF9V-X. **HRO Price $69.95**

NEW!

HF9V-X

The HF9V-x is a no-radial vertical that covers the amateur bands 6 through 75 / 80 meters. If you have no room for a radial system, install the HF9V-X over the CPK counterpoise kit. Like the HF6V, it uses longer active elements for higher radiation resistance and greater efficiency.

"Butterfly" Beam HF5B

A compact 2-element beam for 10-12-15-17-20 meters. A good antenna where there are antenna restrictions.

VAN GORDEN

Dipole Kits

Wire dipole antenna kits complete with a Hi-Q balun, copper antenna wire, ceramic antenna insulators, and 100-foot nylon support rope.

Standard Length

Models D-10 for 10 meters, D-15 for 15 m, D-20 for 20 m, D-40 for 40 m, and D-80 for 75 / 80 m.

Shortened

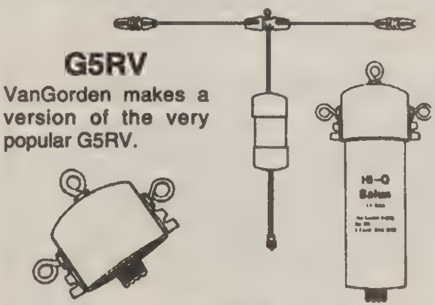
Models SD-40 for 40 m and SD-80 for 75 / 80 m.

Parallel

These models are made of multiple dipoles connected at the center balun and fed at this one point. Model PD-8010 is for 10-80 meters, PD-8040 is for 40 and 80 m, PD-4010 is for 10-40 m, and PD-4020 is for 20-40 m.

G5RV

VanGorden makes a version of the very popular G5RV.



Insulators / Baluns

Egg insulators. Center and end insulators. 1:1 and 4:1 Baluns.

SWL Antennas

Antenna Supermarket

SWL Sloper

The SWL Sloper covers the popular SWL bands from 11-120 meters. Automatic band switching. SO-239 connector for attaching coaxial cable.
HRO Price: $79.95

Eavesdropper™

This antenna is a high performance trapped dipole, 42 feet long, for the 11-60 meter SWL bands. Model "T" is fed with supplied 72 ohm balanced feed line. Model "C" will accept coax (not provided) requiring a PL-259 connector.
HRO Price: $79.95

DYMEK DA100E

The World's Most Respected Short-Wave Active Antenna

Frequency Coverage: 50 kHz to 30 MHz, continuous
Antenna Height: 4 feet 8" (142cm)
Output Impedance: Switch selectable 50,100, 500 ohms
Power Required: 110-120 or 220-240 VAC switch selectable, 50-60 Hz, 4 watts, or 12 VDC 0.4 Amp
Dimensions: Power Supply: 6.5" x 3" x 7.5" (WxHxD) (16.5 x 7.6 x 1 9cm)
Antenna Module: 3.75" x 4.375" x 2" (WxHxD) (9.5 x 11 x 5cm)
Shipping Weight: 9 lbs. (4.1 kg)
Attenuation: Switch selectable 0,10, 20 dB
HRO Price: $179.95

Van Gorden Antennas

Model	Type	Band	Length ft (m)	Power PEP	Wire Size	HRO Price
D-10	Standard Dipole	10	16(4.9)	2KW	#14	$25.95
D-15	Standard Dipole	15	22(6.7)	2KW	#14	$26.95
D-20	Standard Dipole	20	33 (9.9)	2KW	#14	$27.95
D-40	Standard Dipole	15/40	66 (19.8)	2KW	#14	$28.95
D-80	Standard Dipole	75/80	130 (39)	2KW	#14	$31.95
ALL-BANDER	Standard Dipole	160-10 *	134 (40.8	2KW	#14	$29.95
SHORTY	Dipole	160-10 *	70(21)	2KW	#14	$39.95
SD-40	Shortened Dipole	40	45 (13.5)	2KW	#14	$33.95
SD-80	Shortened Dipole	75/80	90 (27)	2KW	#14	$35.95
PD-8010	Parallel Dipole	10 to 80	130 (39)	2KW	#14	$43.95
PD-8040	Parallel Dipole	15/40/80	130 (39)	2KW	#14	$39.95
PD-4010	Parallel Dipole	10, 20, 15/40	66 (19.8)	2KW	#14	$37.95
PD-4020	Parallel Dipole	20, 15/40	66 (19.8)	2KW	#14	$33.95
G5RV	Dipole	3.5-30 MHz	102(31)	2KW	#14	$49.95

* Antenna tuner required

Butternut Antennas

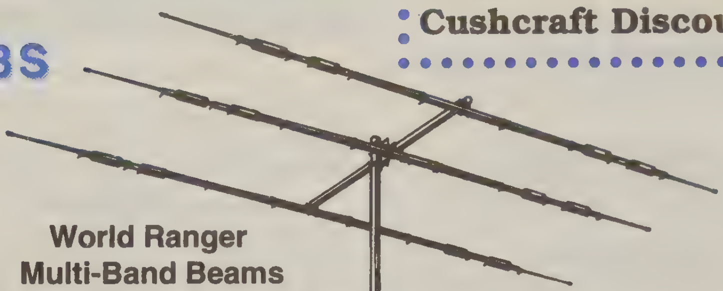
Model	Bands	Ele	Max Gain	VSWR	Turn Radius ft (m)	Longest Element ft (m)	Boom Length ft (m)	Max Mst in (mm)	Wind Srvl mph	Ship Wgt lbs	Sugg. List
HF5B	10-15-20 m	2	3-5 dB	1.5:1	6.9 (2.1)	12.5 (3.6)	6 (1.8)	1.3 (38)	80	22	$339.95
HF2V	40-80 m	1		1.5:1		32 (9.7)		1.3 (32)	60	17	$200.95
HF6VX	10-80 m	1		1.5:1		26 (7.9)		1.3 (32)	80	12	$219.95
HF9VX	6-80 m	1		1.5:1							$329.95

cushcraft

THE ANTENNA COMPANY

Call Toll-free for Cushcraft Discounts

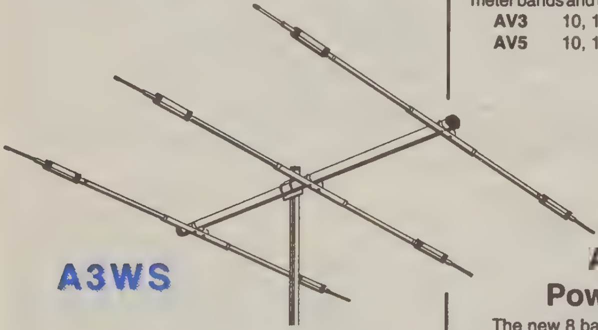
A3S



World Ranger Multi-Band Beams

The four element **A4S** with stainless steel hardware outperforms other beams in day-to-day operation and the tough competition of contests. It has achieved the success of DXCC in only two days. The combination of precisely tuned traps with excellent spacing to element length ratios make the **A4S** a proven winner. Designed for easy assembly, the **A4S** is light weight, built to last and has a clean profile to reduce wind load. The **A3S**, now with all stainless steel hardware, is the most popular three element three band beam available today. It has plenty of gain and good front to back ratio. Great performance is yours with a clean profile beam that can be mounted on a lightweight tower and rotor in a very small space. Rugged design features insure many years of trouble free operation.

A3S	10, 15, 20 meter 3 element, 8.0 dBd gain Yagi
A4S	10, 15, 20 meter 4 element, 8.9 dBd gain Yagi



A3WS

WARC Band Beam

The **A3WS** 3 element beam gives full performance on 12 and 17 meters. With the addition of our easy to use A103 add-on kit, it will also cover 30 meters. It needs only a lightweight tower and rotator or you can mount it above your existing tribander. **A3WS** features include pinned boom sections, heavy duty element clamps with backing plates plus all stainless steel hardware.

A3WS	18, 24 MHz 8 dBd gain Yagi
A103	10 MHz (30 meter) kit for A3WS

Rotatable Dipoles

SINGLE AND MULTIBAND

Our World Ranger Dipoles give bi-directional performance and rotatable convenience. You can mount them high and away from the trees for much better performance than a wire dipole. Our single and multiband dipoles feature high-performance traps, heavy wall tubing and rugged hardware for years of reliable operation

D40	40 Meters	Dipole
D4	10, 15, 20, 40 Meters	Dipole
D3	10, 15, 20 Meters	Dipole
D3W	12, 17, 30 Meters	Dipole

World Ranger Four Band Kits

Convert Cushcraft A3S and A4S beams to four bands with this simple add-on kit. You'll be able to work the 40 meter DX when sun spots are low. With an easy adjustment, the new 10 MHz WARC band is available.

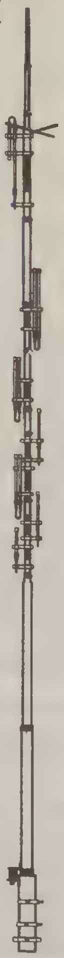
A743	30 or 40 meter kit for A3S
A744	30 or 40 meter kit for A4S

Multi-Band Verticals

Economical high-performance antennas for today's active multi-band station. Automatic switching, broadband enclosed traps. These verticals may be roof or ground mounted. Model **AV5** for 80 to 10 meter bands and the **AV3** for 20-15-10 meters.

AV3	10, 15, 20 meters
AV5	10, 15, 20, 40, 80 meters

AP8A



AP8A Powerwave

The new 8 band HF quarterwave features thick wall tubing and high tensile fiberglass for exceptional strength. The **AP8A** covers 10, 12, 15, 17, 20, 30, 40 and 80 meters and is designed for maximum performance using high quality components yet is priced for every ham's budget. Assembly is a snap using just a few basic tools.

The heart of the **AP8A** is the POWERWAVE TRAP which incorporates a time proven Cushcraft capacitor design. This results in compact traps with better frequency selectivity and 10% greater radiation efficiency.

The **AP8A** is constructed of heavy seamless aluminum and stainless steel hardware. Capacitor sections are sealed and bonded with adhesive lined heat shrink tubing. It stands 26 feet tall.

The **AP8A** is the most versatile quarterwave vertical for the amateur from novice to extra class. Ground radials are needed for optimum performance.

AP8A	10, 12, 15, 17, 20, 30, 40, 80M
APR18A	Radial Kit (For use with AP8A or any other HF vertical)

Now 30 & 40 Meters

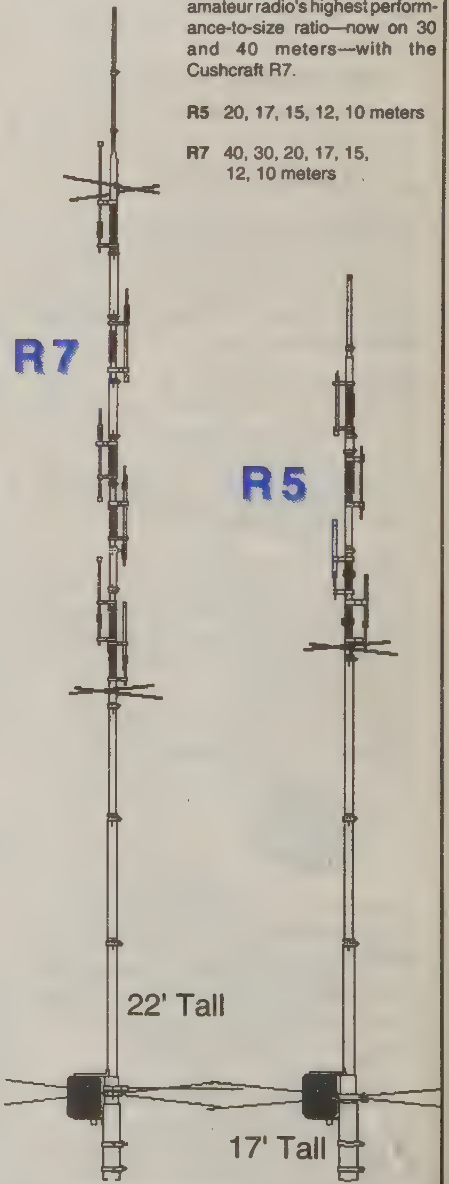
R7, R5

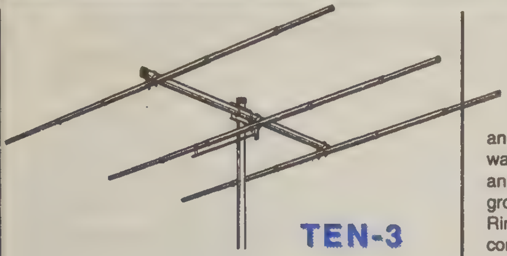
IT'S THE ONE YOU'VE ASKED FOR. Amateur radio's **Most Popular** vertical design now gives you 30 & 40 meters with **NO GROUND RADIALS**! Only 22 feet tall, the R7's small footprint and ground independence give you "mount-anywhere" flexibility. Assembly is a snap.

Automatic frequency selection and 7 short counterpoise rods let you concentrate on DXing, contesting or rag-chewing from your apartment, condo or motor home. Convenience is only one reason to own an R7. The main reason is performance—pile-up breaking power made possible by the R7's low angle of radiation. This might explain why so many hams with room to spare have chosen the R5 and now the R7.

Like the R5, your only connection to the R7 is the coax to your rig. Experience amateur radio's highest performance-to-size ratio—now on 30 and 40 meters—with the Cushcraft R7.

R5	20, 17, 15, 12, 10 meters
R7	40, 30, 20, 17, 15, 12, 10 meters

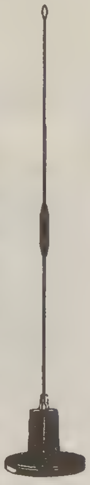




New For 10 Meters

Our all new 3 element beam for the novice, technician or any ham who wants more gain with a good front-to-back ratio on 10 meters. This antenna is on an 8 foot boom making it easy to install on a very simple mount with only a lightweight rotator. The matching system is our proven Reddi-Match for 50 Ohm, no balun feed and SO-239 connector. Make more positive contacts with the new **TEN-3**.

TEN-3	3 Element	8.0 dBd gain



Dual Band Mobile
CS-270M

The perfect companion for your dual band transceiver is our new **CS-270M.** It offers 3.7 dB gain on 2 meters and 6.0 dB on UHF in one compact 36.5 inch antenna

The base utilizes a unique matching network designed on a rugged P.C. board frame. A small phasing coil is insert molded into the antenna rod making it impervious to moisture. The magnetic mount features 90 pound pull, protective mylar pad, low loss feedline and PL-259 connector.

10 Meter Mobile

CS28M is an all new magnet mount mobile for 10 meters. It is an ideal companion to those new 10 meter multimode rigs. Cushcraft/Signals mobiles are recognized by professional users around the world for their rugged good looks and dependability. The antenna is complete with 49" stainless steel whip and spring and 90 pound pull chrome plated magnet with Protective Mylar® pad. Twelve feet of high quality RG-58AU coax and PL-259 connector. You'll be on the air in a matter of minutes, operating mobile to Munich and many more DX locations.

VHF / UHF Mobile Antennas

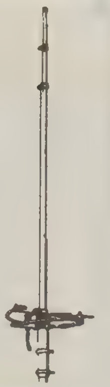
Cushcraft high performance, better-value mobile antennas have sleek black ABS housings with stainless steel springs and tapered stainless whips. With 90 pound pull magnet. They will enhance the appearance of any vehicle.

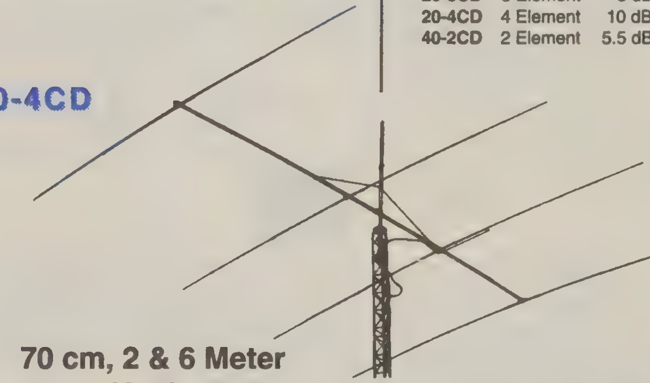
CS50M	50-54 MHz	Magnetic Mount w/coax
CS147M	144-174 MHz	Magnetic Mount w/coax
CS220M	220-225 MHz	Magnetic Mount w/coax
CS450M	435-470 MHz	Magnetic Mount w/coax
CS1147M	144-148 MHz	Magnetic Mount w/coax
CS1450M	435-450 MHz	Magnetic Mount w/coax
CS270M	2m/70cm	Magnetic Mount w/coax

Ringo
The Choice for the Impossible QTH!

A combination of compact size and great bandwidth. Ringo half-wavelength verticals feature a low angle of radiation and direct DC ground for lightning protection. The Ringo is very easy to assemble and comes in a model for all popular VHF and UHF frequencies. Models AR-2 for 2 meters, AR-6 for 6, AR-10 for 10 meters and AR-220 for 220 MHz.

AR-2	135-160 MHz - 4' Tall
AR-6	50-54 MHz - 10' Tall
AR-10	28-29.7 MHz - 18' Tall
AR-220	220-225 MHz - 3' Tall



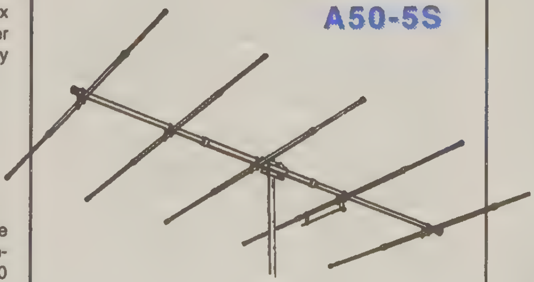


70 cm, 2 & 6 Meter Yagis

The performance of these antennas will please you! They are lightweight, durable, and can have you on the air in a short time. Good bandwidth, tapered length elements, 50 Ohm no balun feed with SO-239 connector and protective boot are a few of the features. You'll hear many of these fine antennas still on the air more than 25 years.

A144-7	7 Element	144-146 MHz Yagi - 8' boom
A148-10S	10 Element	144-148 MHz Yagi - 12' boom
A430-11	11 Element	430-435 MHz Yagi - 5' boom
A50-3S	3 Element	50-54 MHz Yagi - 6' boom
A50-5S	5 Element	50-54 MHz Yagi - 12' boom
A50-6S	6 Element	50-54 MHz Yagi - 20' boom

ALL STAINLESS



Enjoy the new popularity and exciting contacts on the 6 meter band with one of the S-series Cushcraft Yagis.

Computer aided modeling and stainless steel hardware were used by Cushcraft engineers to further optimize the performance of our popular 6 meter Yagis.

Skywalker HF Yagis

The choice of DX'ers worldwide. These single band Yagis are computer optimized to give maximum gain for their boom lengths, with very clean patterns. The 50 Ohm matching system with SO-239 connector easily handles maximum legal power.

Skywalkers are very heavy duty with 2" diameter pinned booms and .058 wall aluminum tubing throughout. The elements are fully adjustable to optimize performance on any band segment. They feature all stainless steel hardware. Winners of the largest ever combined score in the CQ WW DX contest.

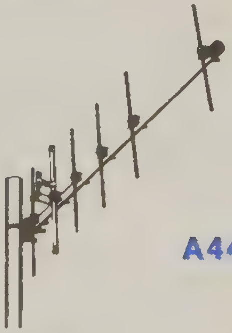
Either single or stacked Skywalkers will improve the performance of your station.

10-3CD	3 Element	8 dBd gain	10 Meters
10-4CD	4 Element	10 dBd gain	10 Meters
15-3CD	3 Element	8 dBd gain	15 Meters
15-4CD	4 Element	10 dBd gain	15 Meters
20-3CD	3 Element	8 dBd gain	20 Meters
20-4CD	4 Element	10 dBd gain	20 Meters
40-2CD	2 Element	5.5 dBd gain	40 Meters

4-6-10-11-20 Element FM Yagis

Cushcraft FM Yagis are specifically cut for FM amateur frequencies and vertical polarization. Our four and six element models have end brackets for tower or mast side mounting. They feature Reddi-Match driven elements with direct 50 Ohm feed, compact size, good gain, and front-to-back ratio. And you can count on quick and easy assembly. Models include 124WB, A147-11, A449-6 and A449-11.

These antennas are great for packet operation.

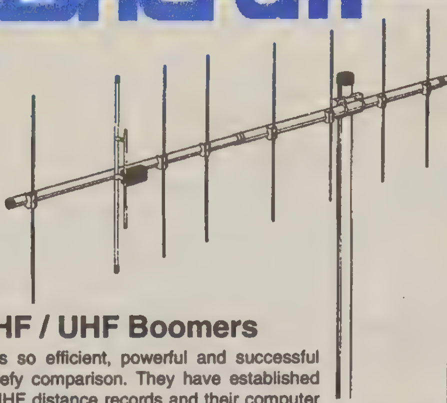


124WB	4 Element	144-148 MHz - 4' boom
A148-3S	3 Element	146-148 MHz - 3' boom
A148-10S	10 Element	144-148 MHz - 12' boom
A148-20S	20 Element	144-148 MHz - 12' boom
A449-6	6 Element	440-450 MHz - 3' boom
A449-11	11 Element	440-450 MHz - 4' boom

Vertically and Horizontally Polarized

A147-20T	20 Element	144-148 MHz - 11' boom

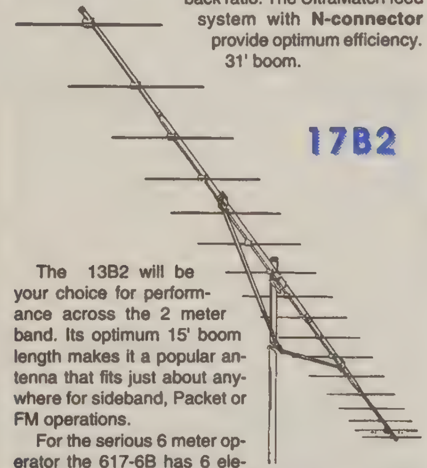
cushcraft



VHF / UHF Boomers

Antennas so efficient, powerful and successful that they defy comparison. They have established new VHF/UHF distance records and their computer based design has become the standard for others to copy.

There are 2 new Boomers for the 2 meter band! The all new 17B2 has a forward gain of 18.0 dBd with an incredibly clean pattern and excellent front to back ratio. The UltraMatch feed system with **N-connector** provide optimum efficiency. 31' boom.



The 13B2 will be your choice for performance across the 2 meter band. Its optimum 15' boom length makes it a popular antenna that fits just about anywhere for sideband, Packet or FM operations.

For the serious 6 meter operator the 617-6B has 6 elements on a 34 foot boom and 15.8 dBd gain.

The 220 MHz band features the all new 224WB 4 element and 225WB 15 element for FM simplex and repeater operation. The 220B is for the serious DX'er. At 70 cm you can choose the band opening 424B, 7.6 wavelength18.2 dBd gain Boomer.

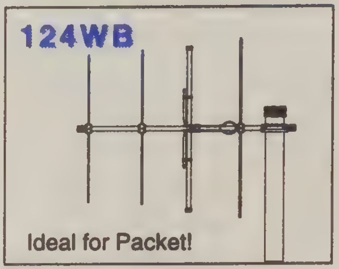
All Cushcraft Boomers are built with stainless steel hardware, ultraviolet stabilized element insulators and the balun is included.

124WB	144-148 MHz	4 elements - SO-239
13B2	144-148 MHz	13 elements - N conn.
17B2	144-145 MHz	17 elements - N conn.
26B2	144-148 MHz	26 elements - SO-239
220B	220-223 MHz	17 elements - SO-239
224WB	220-225 MHz	4 elements - SO-239
225WB	220-225 MHz	15 elements - SO-239
424B	429-435 MHz	24 elements - N conn.
617-6B	50-51 MHz	6 elements - SO-239

Four Pole Vertical Arrays

Cushcraft's four halfwave dipole array is excellent for use as a primary repeater antenna or as a powerful and flexible base antenna. The arrays give 6 dBd omni and 9 dBd cardioid gain. They are complete with dipoles, hardware, mounting booms and harness for 50 ohm feed. They direct side mount to tower legs or on a separate support mast, which can be 1.5 inch to 2 inch steel pipe. The support mast is not supplied.

AFM-4DA	144-148 MHz	- 23' tall
AFM-24DA	220-225 MHz	- 15' tall
AFM-44DA	435-450 MHz	- 8' tall



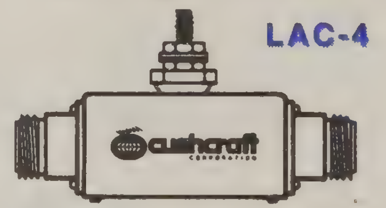
Ideal for Packet!

NEW!

A270-10S
2m - 70cm Dual-Band

This antenna is the latest from Cushcraft. It offers full dual-band coverage for 2m and 70cm in one package. There are 5 elements on each band for up to 10 dB forward gain. For convenience it come in an end mount package.

New Fast Action Gas Discharge Lightning Arresters



Protect your valuable equipment while reducing atmospheric noise with these sophisticated new lightning arresters. They feature fast action, replaceable gas discharge elements. Superior design and manufacturing gives better performance with less insertion loss.

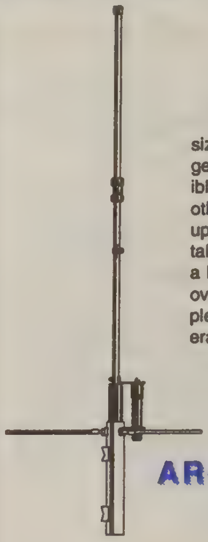
LAC4	200 Watt with SO-239 connector
LAC4H	2 kW with SO-239 connector
LAC4N	200 Watt with N-connector
LAC4NH	2 kW with N-connector
LC2	200 Watt replacement cartridge
LC2KW	2 kW replacement cartridge

Blitz Bug

User proven, full-time coaxial lightning protector. Precision machined Blitz Bug features a sealed air chamber, constant static drain and controlled voltage discharge. Rated at 2 kW PEP to 500 MHz; has negligible insertion loss. Model LAC-1 has one PL-259 and one SO-239 connector. Model LAC-2 has two SO-239 connectors. Call Today. for HRO's Low Prices!!

AR-270
Dual Band Ringo

The highest performance-to-size ratio is yours with this rugged package. This great "invisible" antenna for condos and other restrictive QTH's will be up and running in the time it takes to tighten two clamps and a PL259. AR-270 is your best overall choice for repeater, simplex, packet or micro-sat operation. Stands only 4' tall.



Ringo Ranger
II

Ringo Ranger II (**ARX-2B**) has more gain, less wind load and better mechanical strength than most other 2 meter antennas. You'll find FM repeater or simplex and packet operation more satisfying with this amazing antenna.

Three 5/8 wave radiating elements and an adjustable 1/8 wave phasing stub give 7 dB gain over a 1/4 wave whip. The antenna has RF decoupling radials and a built in coaxial lightning arrester.

There are more Ringo Rangers in use than **ANY OTHER** base station ham antenna.

Improve your station with a Ringo Ranger.The base antenna used more than any other; a proven performer.

ARX-2B is 14' tall.

Ringo Ranger

A fantastic antenna. The Ringo Ranger should be your antenna where good gain is required, but space does not allow extra height and decoupling radials. 4.5 dB gain. Model ARX-2. 9.3' tall.

Oscar Package AOP-1

This complete package includes the A144-20T (145 MHz downlink), 416TB (435 MHz uplink), and A14-TMB cross boom and plate for mounting the assembly to your elevation rotator.

Polarity Switcher
PS4

Optimize your UHF uplink signal with the PS4 polarity switch. It mounts easily to your 416-TB UHF Yagi. Just supply 12 volts DC and you're ready to go.

Cushcraft HF Antennas

Model	Bands	Ele	Max Gn dBd	MaxFB dB	SWR	Turn Rad ft(m)	Longest Ele ft(m)	Boom Lgth ft(m)	Boom Dia in (mm)	MxMst in (mm)	Surface sq ft(sq m)	Ship Wgt lbs	Sugg. List
A3S	10/15/20 meters	3	8	25	1.2:1	15.5 (5.6)	27.75 (8.3)	14 (4.2)	1.5 (38)	2 (51)	4.36 (.47)	27	$445.95
A3WS	12/17meters	3	8	25	1.2:1	14.4 (4.4)	25.1 (7.66)	14 (4.27)	1.5 (3.81)	2 (51)	4.1 (.38)	23	$360.00
A4S	10/15/20 meters	4	8.9	25	1.2:1	18.4 (5.6)	32 (9.75)	18 (5.4)	2.0 (51)	2 (51)	5.5 (.51)	37	$550.00
AV-3	10/15/20 meters	1			1.2:1		14 (4.2)ht		1.375 (35)	1.75 (45)	1.02 (.1)	7	$115.00
AV-5	10/15/20/40/80 meters	1			1.2:1		25 (7.4)ht		1.375 (35)	1.75 (45)	1.89 (.19)	10	$206.00
AP-8A	10/12/15/17/20/30/40/80 meters	1			1.2:1		26 (7.92)ht		1.375 (35)	1.75 (45)	1.7 (.16)	10	$273.95
R-5	10/12/15/17/20 meters	1	3 *		1.2:1		17 (5.2)ht		1.75 (44)	1.75 (45)	1.4 (.13)	8	$370.00
R-7	10/12/15/17/20/30/40 meters	1	3 *		1.2:1		22.5 (6.9)ht		1.75(44)	1.75	2.3 (.2)	13	$510.00
AR-10	10 meters	1	3.75		1.2:1		17.6 (5.3)ht		1.25(32)	1.25(32)	1.68 (.17)	4	$67.95
20-4CD	20 meters	4	10	30	1.2:1	23.75 (7.2)	36.1 (11.0)	32 (9.75)	2.13 (54)	2 (51)	8.1 (.75)	55	$584.95
20-3CD	20 meters	3	8	30	1.2:1	20 (6.1)	35.9 (10.9)	20 (6.1)	2.0 (51)	2 (51)	5.5 (.51)	30	$409.95
40-2CD	40 meters	2	5.5	20	1.2:1	23.93 (7.29)	43 (12.9)	23 (6.9)	2.13 (54)	2 (51)	6.38 (.57)	44	$584.00
TEN-3	10 meters	3	8	25	1.2:1	10 (3.01)	17.8 (5.43)	8 (2.44)	1.38(35)	2 (51)	2.0 (.2)	10	$140.95
10-3CD	10 meters	3	8	30	1.2:1	10 (3.05)	17.66 (5.38)	10 (3.1)	1.63 (41)	2 (51)	2.3 (.21)	11	$217.95
10-4CD	10 meters	4	10	30	1.2:1	11.5 (3.5)	17.58 (5.34)	16 (5.18)	1.75 (44)	2 (51)	3.1 (.29)	18	$279.95
15-4CD	15 meters	4	10	30	1.2:1	15.5 (4.72)	23.33 (7.11)	20 (6.10)	2.0 (51)	2 (51)	4.5 (.42)	25	$330.00
15-3CD	15 meters	3	8	30	1.2:1	13.5 (4.11)	23.26 (7.06)	14 (4.27)	2.0 (51)	2 (51)	3.4 (.32)	20	$284.95
D3W	12/17/30 meters	1			1.2:1	17 (5.18)	34(10.36)			2 (51)	.9 (.08)	11	$232.00
D3	10/15/20 meters	1			1.2:1	13 (3.96)	25.7 (7.83)			2 (51)	.9 (.08)	9	$227.00
D4	10/15/20/40 meters	1			1.2:1	18 (2.49)	35.8 (10.91)			2 (51)	1.3 (.12)	13	$309.00
D40	40 meters	1			1.2:1	21 (6.40)	42.25 (12.87)			2 (51)	1.3 (.12)	12	$276.00

ht= height * dBi

Cushcraft VHF / UHF Antennas

Model	Bands	Ele	Max Gain dBd	Max F/B dB	Polarization	Turn Rad ft (m)	Long Ele ft (m)	Boom Lg ft (m)	MxMst in (cm)	Surface sq ft (sq m)	Ship Wgt lbs	Sugg. List
124-WB *	144-148	4	10.2	24	Either	4 (1.2)	3.4 (1.0)	4 (1.2)	2.0 (5.0)	.34 (.03)	3	$69.95
13B2	144-148	13	15.8	26	Either	8.9 (2.7)	3.4 (1.0)	15 (4.6)	2.0 (5.0)	1.8 (.17)	7	$135.00
224-WB *	220-225	4	10.2	24	Either	3 (.9)	2.2 (.67)	3 (.9)	2.0 (5.0)	.23 (.02)	2	$66.95
225-WB	220-225	15	15.5	24	Either	5.8 (1.8)	2.2 (.67)	10 (3)	2.0 (5.0)	.95 (.09)	6	$140.00
26B2	144-148	26	18.8	26	Vertical	10.4 (3.2)	3.4 (1.0)	15 (4.6)	2.0 (5.0)	4.8 (.5)	22	$382.00
A148-3S	2 m	3	7.8	25	Either	2.8 (.85)	3.3 (1.0)	2.8 (.85)	2.0 (5.0)	.27 (.02)	1.5	$45.95
A148-10S	2 m	10	13.2	24	Either	6 (1.8)	3.3 (1.0)	12 (3.6)	2.0 (5.0)	1.21 (.11)	6	$80.95
A148-20S	2 m	20	16.2	24	Either	6.6 (2.1)	3.3 (1.0)	12 (3.6)	2.0 (5.0)	2.8 (.37)	15	$220.95
A144-10T	2 m	10	10.5	20	Circular	3.4 1.04)	3.3 (1.0)	5.8 (1.8)	1.5 (3.8)	.74 (.07)	4	$101.95
A144-20T	2 m	20	12.2	20	Circular	5.8 (1.78)	3.3 (1.0)	10.8 (3.3)	1.5 (3.8)	1.42 (.13)	7	$145.95
A147-20T	2 m	10	11.1	20	Dual	6.8 (2.0)	3.3 (1.0)	10.8 (3.2)	1.5 (3.8)	1.42 (.13)	7	$118.95
17B2	144-145	17	18	26	Horizontal	17.3 (5.3)	3.4(1.0)	31 (9.5)	2.0 (5.0)	3.9 (.4)	16	$232.00
220-B	220-223	17	17.2	30	Horizontal	9 (2.6)	1.1 (.34)	19 (5.8)	2.0 (5.0)	2.6 (.24)	11	$181.00
416-TB	435 MHz	16	12.5	20	Circular	6.7 (2.04)	1.1 (.34)	6.6 (2.0)	2.0 (5.0)	.5 (.046)	5	$119.95
424-B	424-435	24	18.2	30	Horizontal	10 (3.1)	1.1 (.34)	17.4 (5.3)	2.0 (5.0)	2.3 (.21)	5	$155.00
A449-6 *	440-450	6	10.5	18	Either	2.9 (.88)	1.1 (.34)	2.9 (.88)	2.0 (5.0)	.3 (.03)	3	$56.95
A449-11	440-450	11	13.2	20	Either	2.8 (.8)	1.1 (.34)	4.2 (1.4)	2.0 (5.0)	.39 (.04)	4	$81.95
A50-3S	6 m	3	8	20	Horizontal	6 (1.8)	9.8 (3.0)	6.0 (1.8)	2.0 (5.0)	1.8 (.17)	7	$103.00
A50-5S	6 m	5	10.5	24	Horizontal	7.5 (2.3)	9.8 (3.0)	12 (3.7)	2.0 (5.0)	2.7 (.25)	11	$170.95
A50-6S	6m	6	11.6	26	Horizontal	11 (3.4)	9.8 (3.0)	20 (6.1)	2.0 (5.0)	4.5 (.4)	18	$276.95
617-6B	6 m	6	14	30	Horizontal	17.7 (5.4)	9.5 (2.9)	34 (10.4)	2.0 (5.0)	4.8 (.45)	26	$399.95
AFM-4DA	144-148	4	6/9 dB		Vertical		23 (7) ht		2.0 (5.0)	2.54 (.24)	7	$138.95
AFM-24DA	220-225	4	6/9 dB		Vertical		15 (4.6) ht		2.0 (5.0)	1.85 (.17)	6	$123.95
AFM-44DA	435-450	4	6/9 dB		Vertical		8 (2.4) ht		2.0 (5.0)	1.13 (.10)	5	$107.95
AR-2	135-160	1	3.75 dB		Vertical		3.9 (1.2) ht		1.25 (3.2)	.21 (.02)	2	$47.95
ARX-2	137-160	1	4.50 dB		Vertical		9.3(2.8) ht		1.25 (3.2)	.33 (.03)	4	$57.00
ARX-2B	134-164	1	7.00 dB		Vertical		14 (4.2) ht		1.25 (3.2)	.5 (.046)	6	$67.00
ARX-220B	220-225	1	7.00 dB		Vertical		9.3 (2.8) ht		1.25 (3.2)	.3 (.03)	5	$57.00
AR-270	144-148 440-450	1	3.7 5.5		Vertical		3.75 (1.13)ht		2.0 (5.0)	.27 (0.03)	2	$86.00
AR-270N	144-148 430-450	1	9.0 12.0		Vertical		16.5 (5.07)ht		2.0 (5.0)	.95 (0.09)	5	$260.95
A270-10S*	144-148 440-450	5 5	10.0 10.0	20.0 18.0	Either	6 (1.8)	40.3 (102.4)	6.17 (1.9)	2.0 (5.0)	.725 (.07)	2	$99.95
ARX-450B	435-450	1	7.00 dB		Vertical		5 (1.5) ht		1.0 (2.5)	.2 (.02)	1	$69.95
AR-6	6m	1	3.75 dB		Vertical		10.1 (3.1)ht		1.25 (3.2)	.37 (.03)	3	$67.95
CS-270M Mobile	144-148 440-450	1	3.70 dB 6.00 dB		Vertical Mobile		34 inches (.88)				5	$88.95

* End mount Antenna ht= antenna height

Multi-band HF Verticals

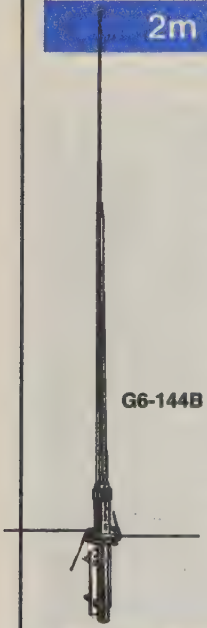
6-BTV / 5-BTV / 4-BTV

Models 6-BTV (10, 15, 20, 30, 40, 75 / 80 meters), 5-BTV (10-80 meters), and 4-BTV (10-40 meters) for base stations. All of these vertical antennas allow full legal limit on SSB or CW. The antennas are constructed of 1 1/4" heavy wall, high strength aluminum. Feed with 50 ohm coax. VSWR 2:1 or better at band edges on 10-40 meters and up to 100 kHz on 75 / 80 meters.

30-MTK

Add the 30 meter band to the 4-BTV or 5-BTV with the 30-MTK. This will provide full band coverage of the 30 meter band and will not affect normal operation of the other bands. The modification is easy to install with all hardware required included. **HRO Price $41.95**

2m Verticals



G6-144B

G7-144

The G7-144 is designed for fixed station or repeater operation. The antenna provides 7dB gain with anextremely low angle of radiation. It is constructed of high strength aluminum and fiberglass using stacked 5/8 wave radiators. Uses a type "N" connector.

G6-144B

The G6-144B is a 6dB gain antenna for base or repeater use. The antenna is totally self supporting and is constructed of high-strength aluminum. Uses an SO-239 connector.

220 & 440 Verticals

G7-220

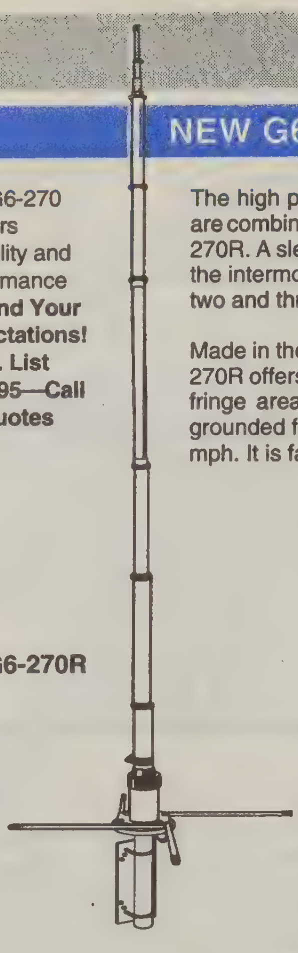
The G7-220 is of similar design and construction as the 2 meter G7-144. It is designed for base or repeater operation, provides 7dB of gain and is constructed of high-strength aluminum and fiberglass. Uses a type "N" connector.

G6-440

The G6-440 is a 6dB gain antenna for base or repeater usage for the 440 MHz band. It is provided with the vertical component assembled. The antenna is constructed from high-strength aluminum and fiberglass. Uses a type "N" connector.

NEW G6-270R Dual Band

The G6-270 delivers reliability and performance **Beyond Your Expectations! Sugg. List $189.95—Call for Quotes**



G6-270R

The high performance of our well known G6-144 and G6-440 are combined in our new 2 m / 440 dual band vertical, model G6-270R. A sleek, one piece tapered fiberglass radome eliminates the intermodulation and mechanical problems associated with two and three piece UHF radome designs.

Made in the U.S.A. of high quality American materials, the G6-270R offers 6 dBd gain (8.1 dBi) on both bands for outstanding fringe area performance. The antenna is shunt-fed and DC grounded for lightning protection and will survive winds to 100 mph. It is factory tuned for quick and easy installation.

Electrical

Max. Power:	200 watts
Gain:	6dBd VHF 6dBd UHF
Bandwidth:	3 MHz VHF 10 MHz UHF
Design:	5/8 over 5/8 VHF 4 x 5/8 UHF Shunt-fed D.C. Ground
Termination:	Type N female

Mechanical

Length:	100 inches
Weight:	6 lbs
Wind Survival:	100 mph
Mounting:	Hardware included for 1-1/2" mast. Mounting plate will accept 2" U-bolts (U-bolts not included)

Hustler Antennas

Model	Bands	M x Gn	VSWR	Radial lgth in (mm)	Height ft (m)	Boom Dia in (mm)	Max Mst in (mm)	Wind load lbs (kg)	Ship Wgt lbs (kg)	Sugg. List
6-BTV	10-30-80 m	-	1.2:1	20.3 (506)	24 (7.2)	1.3 (31.3)	1.5 (38.1)	31 (14.1)	17	$209.95
5-BTV	10 to 80 m	-	1.2:1	20.3 (506)	25 (7.5)	1.8 (43.8)	1.5 (38.1)	29 (13.2)	17	$179.95
4-BTV	10 to 40 m	-	1.2:1	14.8 (369)	21.4 (6.4	1.3 (31.3)	1.5 (38.1)	24 (10.9)	15	$134.95
G7-144*	2 m	7 dB	1.5:1	-	15.3 (4.6	-	1.8 (43.8)	26 (11.8)	10	$189.95
G6-144B	2 m	6 dB	1.15:1	-	9.8 (2.9)	-	1.8 (43.8)	26 (11.8)	7	$129.95
G7-220*	220 MHz	7 dB	1.2:1	-	10.2 (3.0	-	1.8 (43.8)	26 (11.8)	7	$189.95
G6-440*	440 MHz	6 dB	2.1:1	-	7.3 (2.2)	-	2.0 (50.8)	22 (10.0)	5	$169.95

* Type "N" Connector

Hustler VHF / UHF Mobile Antennas

Model	Band	Max Gain	SWR	Power	Length ft (m)	Weight lbs	HRO Price
RX-440	440 MHz	5.2 dB	1.2:1	100 W	2.3 (.72)	3	$24.95
CGT-144	2 m	5.2 dB	1.15:1	200 W	7.1 (2.1)	2	$51.95
RX-2	2m	3.4dB	1.5:1	100 W	4.2(1.3)	3	$24.95
FX-2	2m	3.4dB	1.5:1	100 W	4.2(1.3)	3	$33.95
SF-2	2 m	3.4 dB	1.2:1	100 W	4.2 (1.3)	1	$14.95
UGM	140-500 MHz	Unity				1	$21.95
SF-220	220 MHz	3.4 dB	1.2:1	100 W	2.6 (.78)	1	$14.95

Call Toll-Free For Discount Prices on Hustler Products

VHF / UHF Mobiles

Collinear

The CG-144 and CG-220 are 5.2dB gain collinear antennas for 2m and 220 MHz respectively. These antennas mount with 3/8"x24 thread which will fit the standard Huster mounts. The CGT-144 and CGT-220 are supplied with a heavy duty trunk mount, 17' of coax and PL-259 connector.

5/8 Wave

Hustler manufactures two series of mobile antennas for 2m and 220 MHz and one for 440 MHz. The FX series comes with a heavy duty magnetic mount and the RX series has a standard duty mount. The antennas are base loaded with a 5/8 wave whip. The FX-2, FX-220, RX-2, RX-220 and RX-440 have black bases and chrome whips.

SF-2 / SF-220

These two antennas are for 2m and 220MHz respectively. Each is a base loaded 5/8 wave antenna. These antennas will mount to all the Hustler mounts.

UGM

A magnetic-mount antenna for the traveller. Trim it to operate as a 1/4 wave on 2m, 220 or 440. The mount is supplied with 7' of mini-coax and a BNC connector installed. Attaches directly to most handhelds. The antenna has a chrome base and stainless steel whip.

HF Resonators

There are two types of resonators for HF operation. The **standard** units are rated to 400 Watts SSB while the **supers** are rated at 1 KW SSB. In addition to the power differences, the usable band width of the Super resonators is 100 percent wider on some bands. See the resonator table below for details.

Mounting HF Mobiles

The HF resonators described require some consideration when mounting.

Mount

A bumper (BM-1) or ball type (C32, SSM-1 or SSM-2) mount is required. Magnetic or trunk type mounts will not hold the weight or wind load.

Mast

All of the resonators must be mounted on top of one of the Hustler masts (MO-1, MO-2, MO-3 or MO-4). The MO-1 and MO-2 hinge to allow for travel or low clearances. The MO-1 is for deck or fender mounting and folds at 15" above the base. The MO-2 is for bumper mounting and folds at 27" above the base. The MO-3 is a fixed length mast for use where it will not be necessary to fold over the antenna.

Hustler has a new mast, the **MO-4** for installations requiring a short mast. The mast is just 22 inches tall. Use standard resonators and whips on 40 and 75m. Use standard resonators on 10, 15 and 20 meters with the new whips provided with the MO-4.

Hustler Resonators

Model	Type	Band	Power SSB	Bandwidth 2:1 SWR	Weight lbs	HRO Price
RM-10	Standard	10 m	400 W	150-250 KHz	0.41	$15.95
RM-11	Standard	11 m	400 W	150-250 KHz	0.41	$15.95
RM-12	Standard	12 m	400 W	90-120 KHz	0.41	$15.95
RM-15	Standard	15 m	400 W	100-150 KHz	0.42	$15.95
RM-17	Standard	17 m	400 W	120-150 KHz	0.44	$21.95
RM-20	Standard	20 m	400 W	80-100 KHz	0.46	$21.95
RM-30	Standard	30 m	400 W	50-60 KHz	0.84	$24.95
RM-40	Standard	40 m	400 W	40-50 KHz	0.84	$24.95
RM-75	Standard	75 m	400 W	25-30 KHz	1.05	$26.95
RM-80	Standard	80 m	400 W	25-30 KHz	1.05	$26.95
RM-10-S	Super	10 m	1 kW	250-400 KHz	1	$23.95
RM-15-S	Super	15 m	1 kW	150-200 KHz	1.2	$24.95
RM-20-S	Super	20 m	1 kW	100-150 KHz	1.25	$28.95
RM-40-S	Super	40 m	1 kW	50-80 KHz	1.8	$35.95
RM-75-S	Super	75 m	1 kW	50-60 KHz	2.1	$49.95
RM-80-S	Super	80 m	1 kW	50-60 KHz	2.1	$49.95

Mounting Accessories

Trunk Mounts

Three trunk mounts are available (HLM, HOT and TLM). All bases accommodate the 3/8"x24 thread and come with 17' of low-loss coax with connectors installed. The mounts are for use with VHF and UHF antennas. Do **NOT** use with the HF mobile antennas.

The **HLM** is specifically for hatch and slanted back vehicles. It has a built-in 180 degree adjustable swivel. The **HOT** is an easy on/off base--just spin the knob. The mount cannot be removed while the trunk is closed. It also features a 180 degree swivel. The **TLM** requires no holes to install. It mounts on flat, horizontal surfaces. The **RVM** is for recreational vehicles.

Bumper Mount

Use the **BM-1** bumper type mount with all Hustler mobile antennas including HF. It uses two "J" bolts and a stainless steel strap that will fit bumpers up to 18". It will not fit the molded, plastic bumpers found on some vehicles. The mount comes with a stainless steel ball. Use the L14-144 (12 foot) or L14-240 (20 foot) coax sets to attach directly to the bottom of the ball mount.

Other Accessories

C-32	Chrome Plated Ball Mount	**$11.95**
SSM-1	Ball Mount and Spring	**$46.95**
SSM-2	Ball Mount	**$26.95**
SSM-3	Stainless Steel Spring	**$24.95**
RSS-2	Resonator Spring	**$9.95**
QD-2	Quick Disconnect	**$19.95**

Hustler Mounts

Model	Base Thread	Coax ft (m)	Swival	Weight lb	HRO Price
BM-1	3/8" x 24	optional	180°	2	$19.95
HOT	3/8" x 24	17 (5.1)	180°	1.9	$29.95
TLM	3/8" x 24	17 (5.1)		1.9	$20.95
HLM	3/8" x 24	17 (5.1)	180°	1.7	$22.95
RVM	3/8" x 24	17 (5.1)	180°	1.9	$20.95

Mobile Mounts

C-32

Hustler has a collection of mounts and accessories for attaching your antennas to your vehicle. The most common are described below.

C-32 Chrome-plated ball mount
C-30 Chrome-plated spring
C-29 Stainless steel spring

SSM-1 Professional ball mount and spring
SSM-2 Ball mount
SSM-3 Stainless steel spring

L-14-144 Coax lead 12', PL-259 & lugs for Hustler mounts
L-14-240 Coax lead 20', PL-259 & lugs for Hustler mounts

C-30

SSM-1

DIAMOND ANTENNA

The Standard by Which All Others are Judged

Diamond Base Station Antennas

Model	Bands	Gain, dB	Watts	Conn.	WT (lbs)	Lth (ft)	MPH	Fig	HRO Price
DP-GH62	6m	6	200	UHF	7	21	78	B	$134.95
F-22A	2 m	6.7	200	UHF	5	10.5	112	B	$109.95
F-23A	2 m	7.8	200	UHF	8	15	90	A	$149.95
F-142A	1 1/4 m	5.5	200	UHF	2	6	110	C	$119.95
F-718A*	70 cm	11.5	250	N	5	15	90	A	$199.95
F-1230A	23 cm	13.5	100	N	5	10.5	90	B	$159.95
U300A	70 cm/23 cm	8.6/13.2	100	N	4	8.3	110	C	$159.95
U5000	2m/70/23cm	4.5/8.3/11.7	150	N	3	6	135	C	$149.95
V2000A	6m/2m/70cm	2.1/6.2/8.4	150	UHF	4	8.3	110	B	$149.95
X-50A	2 m/70 cm	4.5/7.2	200	UHF	3	5.6	135	C	$114.95
X-200A	2 m/70 cm	6.0/8.0	200	UHF	4	8.3	112	B	$149.95
X-300A	2 m/70 cm	6.5/9.0	200	UHF	4	10.5	90	B	$159.95
X-510NA	2 m/70 cm	8.3/11.7	200	N	5	17.2	90	A	$199.95
X-510MA	2 m/70 cm	8.3/11.7	200	UHF	5	17.2	90	A	$199.95
X-500HNA	2 m/70 cm	8.3/11.7	200	N	7	17.8	90+	A	$249.95
X-700HA	2 m/70 cm	9.3/13.0	200	UHF	12	24	90	-	$399.95
X-2200	2 m/1 1/4 m	6.0/7.8	200	UHF	4	10.6	112	B	$169.95
X-3200A#	2m/1 1/4m/70cm	6.0/7.8/8.0	100@	UHF	4	10	112	B	$189.95
X-6000A	2m/70/23cm	6.5/9.0/10.0	100	N	5	10	112	B	$199.95

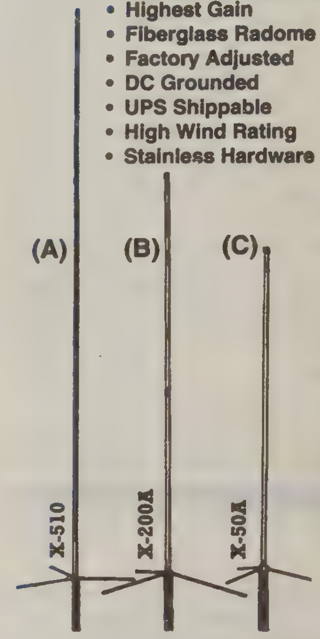
All base antennas grounded for lightning protection #2m: 146-148 MHz

Factory adjusted for American Amateur Bands - No tuning required

* F-718A — 440-450; F718J – 430-440; F718L – 420-430

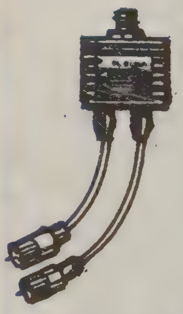
@ 100 wwatts on 2m, 200 watts on 1 1/4m and 70cm

- Wide-Band Performance
- Highest Gain
- Fiberglass Radome
- Factory Adjusted
- DC Grounded
- UPS Shippable
- High Wind Rating
- Stainless Hardware



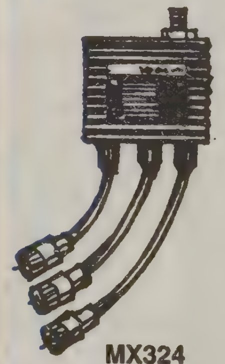
Diamond Duplexers and Triplexers

Model	Port	Freq MHz	CW Watts	PEP Watts	Loss dB	Isol. dB	MIX Conn.	Port Conn.	HRO Price
MX-37N	LPF HPF	1.6 - 470 900 - 1300	100 50		.25 .25	45 45	N-Jack (F)	N-Male/12" cable N-Male/12" cable	$69.95
MX-72D	LPF HPF	1.6-30 140-150 440-460	400 150 100	1KW 400 250	.1 .1 .2	60 60 60	SO-239	PL-259/no cable PL-259/no cable	$51.95
MX-72DN	LPF HPF	1.6-30 140-150 440-460	400 150 100	1KW 400 250	.1 .1 .2	60 60 60	SO-239	PL-259/no cable N-Plug/no cable	$59.95
MX-72H	LPF HPF	1.6-30 140-150 440-460	400 150 100	1KW 400 250	.1 .1 .2	60 60 60	SO-239	PL-259/12" cable PL-259/12" cable	$59.95
MX-72N	LPF HPF	1.6-30 140-150 440-460	400 150 100	1KW 400 250	.1 .1 .1	60 60 60	SO-239	PL-25912" cable N-Male/12" cable	$59.95
MX-214	LPF HPF	140-150 220-225	150 100	400 250	.3 .4	45 45	SO-239	PL-259/12" cable PL-259/12" cable	$69.95
MX-324	LPF BPF HPF	1.6-60 220-225 400-550		800 600 500	.3 .4 .4	40 40 40	SO-239	PL-259/12" cable PL-259/12" cable PL-259/12" cable	$99.95
MX-2000	LPF BPF HPF	1.6-60 110-170 300-950		800 800 500	.15 .20 .25	60 60 60	SO-239	PL-259/12" cable PL-259/12" cable PL-259/12" cable	$89.95
MX-3000	LPF BPF HPF	1.6-160 350-500 850-1300		800 400 200	.15 .25 .30	55 55 55	N-Jack(F)	PL-259/12" cable PL-259/12" cable N-male/12" cable	$82.95
MX-3000D	LPF BPF HPF	1.6-160 350-500 850-1300		800 400 200	.15 .25 .30	55 55 55	N-Jack(F)	PL-259/No cable PL-259/No cable N-male/No cable	$82.95
MX-3000N	LPF BPF HPF	1.6-160 350-500 850-1300		800 400 200	.20 .30 .40	55 55 55	N-Jack(F)	PL-259/12" cable N-Male/12" cable N-male/12" cable	$84.95

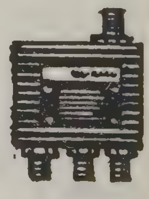


MX-37N
MX-72H
MX-72N
MX-214

MX-72D
MX-72DN



MX324
MX-2000
MX-3000
MX-3000N



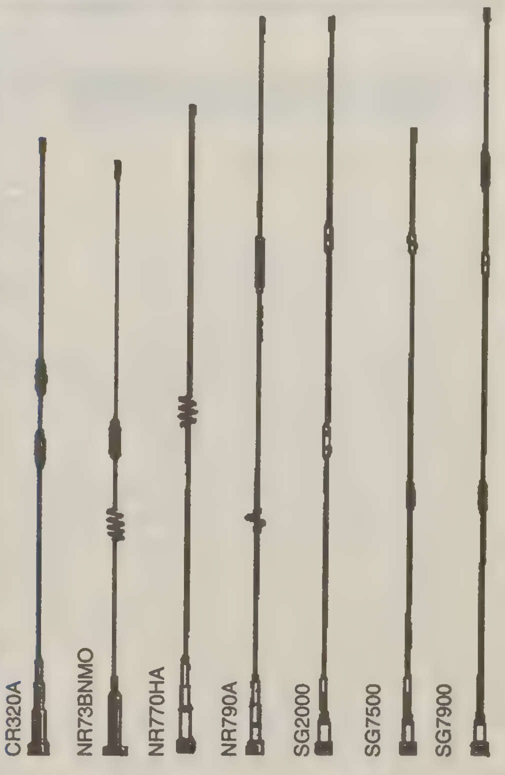
MX-3000D

ANTENNAS & ACCESSORIES

Diamond Mobile Antennas

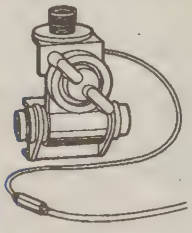
Model	Bands	Gain/dB	Watts	Mount	Lth/in	HRO Price
NR-124	23 cm	8.4	100	N	25	$63.95
NR-140A	1 -1/4 m	4	150	UHF	37	$54.95
SG2000	2 m	5.2	150	UHF	62	$85.95
CR-214S	2 m/1 -1/4 m	2.1/3.4	150	UHF	37	$59.95
CR-224A	2 m/1 -1/4 m	5.0/6.0	200	UHF	68	$92.95
CR-320A#	2 m/1 -1/4 m/70cm	2.1/3.8/5.5	100@	UHF	36	$89.95
NR-72BNMO#	2 m/70 cm	2.1/2.1	100	NMO	14	$42.95
NR-73BNMO#	2 m/70 cm	2.1/5.3	100	NMO	33	$58.95
NR-770HA	2 m/70 cm	3.0/5.5	200	UHF	40	$59.95
NR-770HNMO	2 m/70 cm	3.0/5.5	200	NMO	41	$61.95
NR-770R*	2 m/70 cm	3.0/5.5	200	UHF	39	$59.95
NR-790A	2 m/70 cm	4.5/7.2	120	UHF	58	$89.95
NR-2000NA	2 m/70/23 cm	3.1/6.3/9.7	100	N	39	$79.95
SG7000	2 m/70 cm	2.1/3.8	100	UHF	18	$69.95
SG7200NMO	2 m/70 cm	3.2/5.7	150	NMO	38	$84.95
SG7500	2 m/70 cm	3.5/6.0	150	UHF	41	$82.95
SG7900	2 m/70 cm	5.0/7.6	150	UHF	62	$99.95

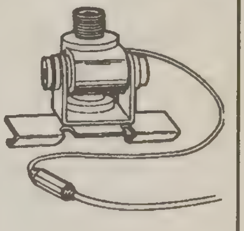
Factory adjusted for American amateur bands, no tuning required.
SG and NR antennas require no ground system.
Mobile antennas have foldover feature with spring loaded hinge (except NR770SA).
Magnetic mount not recommended for antennas over 45".
# Black Anodized finish @ 100 watts on 1-1/4m, 200 watts on 2m and 70cm.

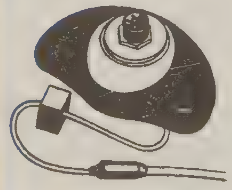


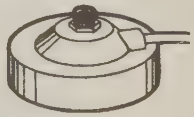
Diamond Mobile Mounts

Model	Description	HRO Price
DP-SPM/5D	UHF type base on heavy 1.5 lb/4" magnetic, 13' 5mm coax/PL-259.	$41.95
DPK-4NM	Type N on Magnet. Similar to DP- SPM/5D. N-Plug. Good to 1300 MHz.	$56.95
K200	Black Trunk/Hatchback mount with fold over feature. 16.5' RG-58A/U w/PL-259	$35.95
K300M	Deluxe rain gutter mount. Black, Adjustable position. 10' cable.	$73.95
K300KM	Deluxe rain gutter mount. Black, adjustable position. 16.5" RG-58A/U w/PL-259	CALL
K400K-3/8M	Basic K400 with fittings for antennas with 3/8-24 thread base w/ cable	$69.95
K400M	Deluxe mount with UHF type base. 16.5 feet RG-188 and low loss 5 mm cable.	$73.95
K400NMO	Deluxe mount withNMO type base. 16.5 feet RG-58/U with PL-259	CALL
K540KM	Deluxe Mirror/Luggage rack mount. Black, adjustable. 16.5' RG58A/U w PL259	$37.95
K550KM	Deluxe mini van luggage rack mount. Black, adjustable. 16.5' RG58A/U w PL259	CALL
K600M	Tilt angle (0-9 degrees) trunk mount. Black. RG-188 and low loss 5 mm cable.	$65.95
K600N	Same as K600M but with type-N connections	$73.95
NMO/UHF	Adapter for imported antennas PL-259 to Motorola NMO base. Max 45" antenna	$18.95
FE-5M	Deluxe cable assembly. 16.5 feet RG-188 and low loss cable. UHF connectors.	$38.95


K300M


K400M


K600M


DP-SPM/5D

Diamond Receiving / Scanner Antennas

Model	Description	HRO Price
RH-77CA	High gain 2m/70cm dual band HT antenna. Receive range to 900 MHZ. BNC	$32.95
RH-951	High gain 2m/70cm/23cm tri-band HT antenna. BNC (Wide band receive)	$52.95
D-505	Mobile antenna. Active, adjustable, 0-20 dB, 500 kHz-1500 MHz. UHF mount required.	$114.95
D-130J	Wideband discone 25-1300 MHz. 200 W transmit 50-1300 MHz. No cable.	$94.95

Order Toll-Free from Canada.

Diamond Accessories

Model	Description	HRO Price
CX-210A	Heavy duty wideband coax switch, DC-1000 MHz. 1.5 kW, SO-239 connector	$47.95
CX-210N	Heavy duty wideband coax switch, DC-1500 MHz. 1.5 kW, N connector.	$89.95

Frequencies

Band	Frequency
6 m	50 - 54 MHz
2 m	144 - 148 MHz
1-1/4 m	222 - 225 MHz
70 cm	440 - 450 MHz
23 cm	1240 - 1300 MHz

Connector Types

Type	Description
UHF	SO-239/PL-259
NMO	Motorola Type

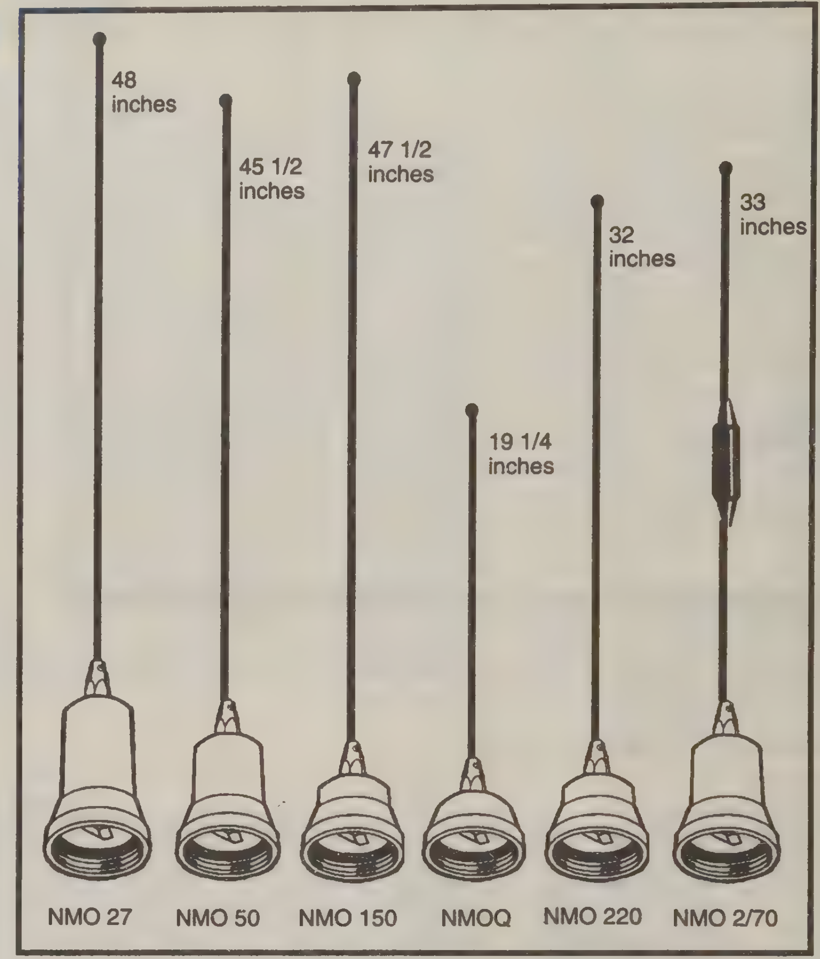
Larsen

NMO Series

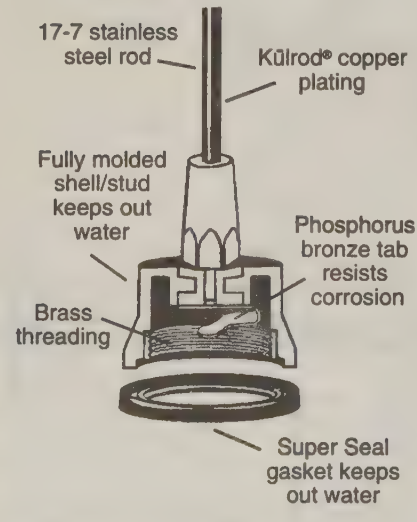
Kūlrod® Mobile Antennas

All Larsen mobile antennas meet the industry's most demanding specs for electrical efficiency and mechanical durability. The result is greater transmit range over many years of service. In addition to the popular Motorola 3/4" (NMO) mounts shown here, mobile antennas for the Larsen Mount (LM) and PO Mount (PO) are excellent choices for amateur use.

- VSWR at 1.5 to 1 or less
- Greater transmit range
- Rated 200 watts output
- 3 yr. No-Nonsense Warranty™
- 3/4" Motorola Style mounts
- Colors: Gray base/Chrome whip or all black
- Mounts: NMO K premium quality rooftop
  NMO MM mag mount, 90# pull strength
  NMO TLM heavy duty trunk lid
  NMO TMB electropolished trunk gutter bracket


48 inches
45 1/2 inches
47 1/2 inches
19 1/4 inches
32 inches
33 inches
NMO 27
NMO 50
NMO 150
NMO Q
NMO 220
NMO 2/70

Model NMO 440


17-7 stainless steel rod
Kūlrod® copper plating
Fully molded shell/stud keeps out water
Phosphorus bronze tab resists corrosion
Brass threading
Super Seal gasket keeps out water

Model NMO 27 (10m)

Band	27-30 MHz
Electrical	1/4 wave, loaded
Gain	Unity

Model NMO 50 (6m)

Band	45-54 MHz
Electrical	1/4 wave, loaded
Gain	Unity

Model NMO 150 (2m)

Band	144-174 MHz
Electrical	5/8 wave
Gain	3 dBd

Model NMOQ

Band	144-448 MHz
Electrical	1/4 wave
Gain	Unity

Model NMO 220 (1.25m)

Band	220-225 MHz
Electrical	5/8 wave
Gain	Unity

Model NMO 440 (70cm)

Band	440-460 MHz
Electrical	5/8 over 1/2
Gain	4.5 dBd

Model NMO 2/70 (2m/70cm Dual band)

Band	144-148; 442-448 MHz
Electrical	5/8 wave VHF Collinear UHF
Gain	4 dBd UHF 2.4 dBd VHF

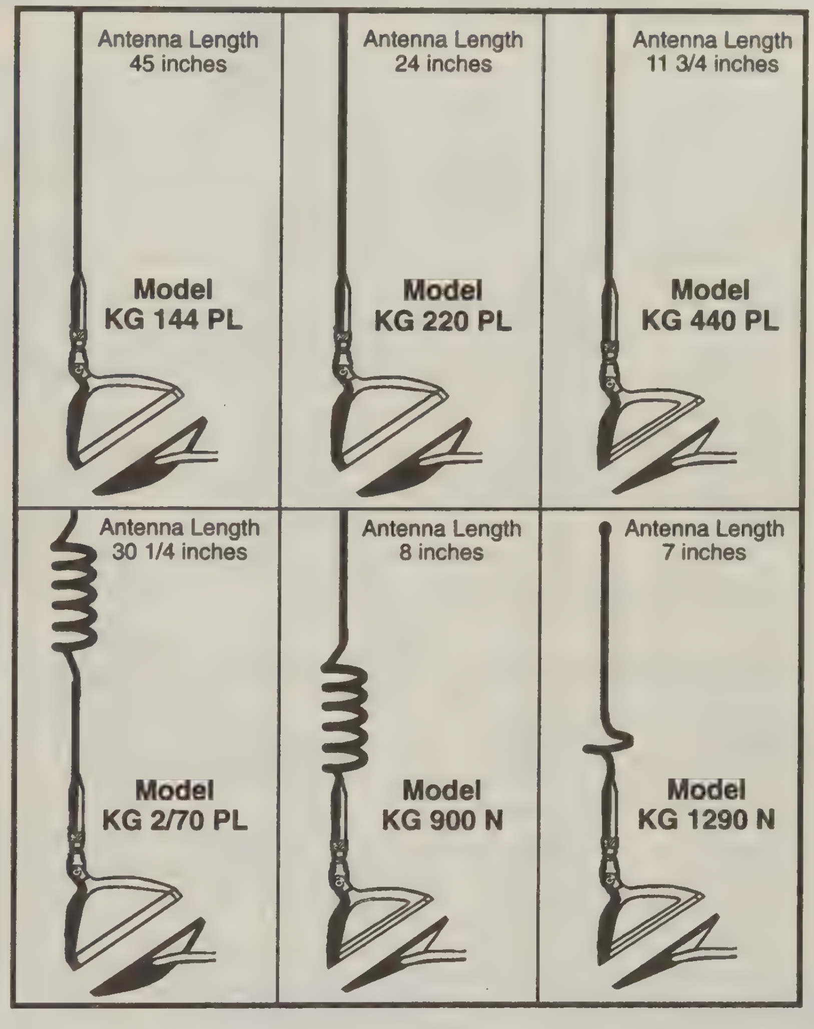
Order Your Larsen Antenna Toll-Free

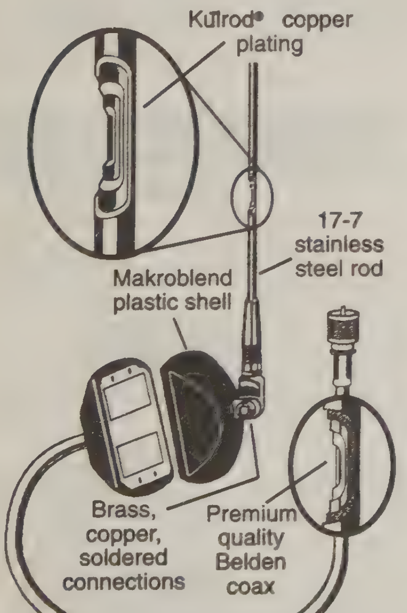
KG Series

Kūlglass® Antennas

Larsen's advanced design techniques in glass mount antennas result in superior transmit range plus tremendous mechanical durability. Today the glass mount design's performance is nearly identical to rooftop mounts, with no holes to drill. Properly installed on-glass antennas grip for years under demanding conditions, yet are easy to remove and remount.

- Patented low-impedance design is more efficient electrically
- Greater transmit range
- Transformer located outside vehicle
- Copper plated whips emit more RF
- Rated 50 watts output
- VSWR at 1.5 to 1 or less
- Less than .5 dBd loss through glass vs rooftop
- New circuit board technology locks in solid state performance
- 3M's best on-glass adhesive grip
- 3 year No-Nonsense Warranty™


Antenna Length 45 inches
Model KG 144 PL
Antenna Length 24 inches
Model KG 220 PL
Antenna Length 11 3/4 inches
Model KG 440 PL
Antenna Length 30 1/4 inches
Model KG 2/70 PL
Antenna Length 8 inches
Model KG 900 N
Antenna Length 7 inches
Model KG 1290 N


Kūlrod® copper plating
17-7 stainless steel rod
Makroblend plastic shell
Brass, copper, soldered connections
Premium quality Belden coax

Model KG 144 PL (2m)

NEW SOLID STATE COUPLER

Band	144-160 MHz
Electrical	1/2 wave
Gain	2.4 dBd
Connector	PL 259, (Loose)

Model KG 220 PL (1.25m)

Band	220-224 MHz
Electrical	1/2 wave
Gain	2.4 dBd
Connector	PL 259, (Loose)

Model KG 440 PL (70cm)

Band	440-460 MHz
Electrical	1/2 wave
Gain	2.4 dBd
Connector	PL 259, (Loose)

Model KG 2/70 PL (Dual)

NEW SOLID STATE COUPLER

Band	144-148; 440-450 MHz
Electrical	1/2 wave VHF Collinear UHF
Gain	2.4 dBd VHF; 4.5 UHF
Connector	PL 259, (Loose)

Model KG 900 N (35cm)

Band	865-965 MHz
Electrical	5/8 over 1/2 wave
Gain	2.4 dBd
Connector	N, (Loose)

Model KG 1290 N (23cm)

Band	1240-1300 MHz
Electrical	Collinear, 1/2 over 1/2
Gain	3 dBd
Connector	N, (Loose)

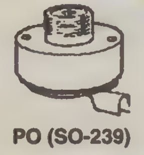
VHF / UHF ANTENNAS FOR . . .

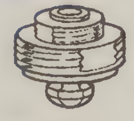
Larsen

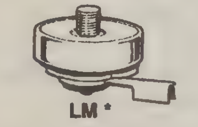
Mobile Antennas

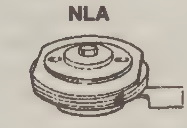
Larsen has a number of mobile antenna configurations. These are assembled based on the frequency, base type (e.g., magnetic mount) and thread type (e.g., NMO). Keep in mind that it is necessary to select the base with the same mounting style as the antenna. To assist in this selection, typical bases and styles are shown below.

Thread Type


PO (SO-239)


NLA

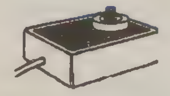

LM *

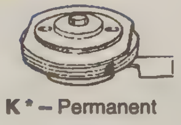

NMO *

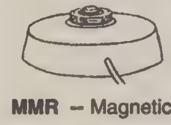
These are examples of each of the thread types. Select one of these and then select the base.

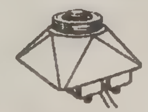
* These are the most popular thread types.

Mount Configurations


MM * -- Magnetic


K * -- Permanent


MMR -- Magnetic


TLM -- Trunk

Each of these mounts comes in one of the thread types. For example, a magnetic mount with an LM type would be called an LMMM.

*These are the most popular base configurations.

MOUNT BASES

Thread Type	Magnetic Mount	Trunk lip Mount	Permanent Mount
LM	LM-MM	LM-TLM	LM-K
NMO	NMO-MM	NMO-TLM	NMO-K
NLA	NLA-MM	NLA-TLM	NLA-K
PO	PO-MM	PO-TLM	PO-K

Antenna Selection

Once the base and thread type are selected, the final step is to choose the antenna. Gain antennas are made of a coil and a whip. Quarter wave antennas are just a whip.This is based on two factors: frequency and gain. For most amateur work, the **frequency choices and gain whips are:**

Frequency	Coil	Whip
2m	150	W490
220MHz	220	W320
440MHz	UHF	W144B

For quarter wave antennas from 2m -- 450 MHz, use Q style antenna. Select the thread type and add Q (e.g., NMOQ for a 1/4 wave antenna with an NMO mount).

On-Glass Antennas

Larsen

Single Band 1/2-Wave

All single band antennas are precut, single 1/2 wave design providing 2.4 dB gain and a maximum power 100 watt rating. The antennas are supplied with a PL-259 connector on 14 feet of premium RG58/Ucable. VSWR is 1.5:1 or less

Model	Description	HRO Price
KG-144-PL	2 meter antenna	$58.85
KG-220-PL	220 MHz antenna	$58.85
KG-440-PL	440 MHz antenna	$49.15

Dual-Band On-Glass

The **KG 2/70** enables simultaneous use of the 2 meter and 70 centimeter bands without sacrificing gain and without drilling a hole in your car. **HRO Price $84.95**

The KG 2/70 is a half-wave on VHF and a collinear on UHF. It achieves 2.5 dBd gain on 2 meters and 4.5 dBd on 70 centimeters. Its maximum power capability is 50 watts. It comes with 14 feet of RG-58/U coax and a PL-259 connector.

The antenna installs easily on any flat surface. Overall height is 36 inches including the mount. Remove the whip without tools for car washes or low garages.

MOBILE MARK, INC.
COMMUNICATIONS ANTENNAS

On Window Dual Band

Mobile Mark's "On Window" dual band antenna can operate anywhere within the 140-174 and 440-470 MHz band widths.

There is no tuning interaction between UHF and VHF. Either band can be tuned up without affecting the tuning of the other band. It provides unity gain. **HRO Price $89.95**

Specifications

Frequency	140-174 and 440-470 MHz
Maximum Power	150 Watts
Bandwidth	10 MHz VHF/ 20 MHZ UHF
Radiator Length	24 inches (61 cm)
Cable	RG58U, 15.5 feet

as
antenna specialists

Amateur Band On-Glass

The co-inductive coupling establishes a highly tuned circuit that transmits and receives radio signals through glass. No holes to be drilled, no ground plane and provides a uniform omnidirectional pattern. **APR-151.3G** uses a 33" whip with 3dB gain for 2m. **AP-220.3G** for 220 MHZ has a 17" whip and with 3dB gain. For 440 MHz **AP-450.3G** provides 3dB gain with an 8" whip and **AP-450.5G** gives 5dB gain with a 30" whip.

AP-143

This unique on-glass styling looks very much like a cellular antenna with the coil in the antenna. Broad banded. No tuning necessary. The length of the whip is only 26 inches. Black coating on the antenna is very attractive. No ground plane required.

Tenna Hitch

Where can you mount your antenna on a car with no bumpers? Where can you mount your HF antennas without punching holes? Do you want to pull a trailer and ham at the same time?

There is a solution. The Tenna Hitch mounts under the ball of your trailer hitch and allows you to use your regular antenna for HF mobile operation. It will support all current HF mobile antennas. The Tenna Hitch comes with all the hardware necessary for mounting on your trailer hitch and still allows you to pull your trailer with no changes. **HRO Price $32.95**

Rubber Duckies

Larsen

Larsen offers several models of "rubber duck" antennas, each with its own special performance characteristics.

Helical

The Helical antennas, approximately 6" in length, are the most commonly used.

HQ

The HQ is a helical quarter wave antenna and offers a higher gain than the normal helical. This antenna is offered only for VHF applications.

HW Half Wave

Available for both VHF and UHF, the 1/2-wave design allows operation independent of the ground plane. It has a rigid impedance transformer at the base and a telescoping, black chrome plated whip with a BNC connector.

2m / 70 cm Duplexers

COMET

Comet Antenna produces the widest variety of antenna duplexers/triplexers available. Features include gold-plated connectors, high isolation and the highest power handling abilities. See pages 106 and 107 in this catalog for details.

DIAMOND ANTENNA

Diamond has a wide collection of duplexers and triplexers for coupling antennas to the transceivers. See pages 100 and 101.

Larsen

Model **AD-2 / 70** provides a bi-directional passive coupler needed when using a single dual-band antenna. Isolation between VHF and UHF is more than 50 dB. Handles 200 watts. **HRO Price $63.70**

YAESU

The **AD-3** duplexer will handle up to 50 watts and comes with short cables to attach to the radio. The VHF cable has an SO-239 and the UHF has a type N connector. VHF to UHF isolation is 50 dB. **HRO Price $52.95**

MOBILES, HANDHELDS, BASE STATIONS

ANLI

Antennas for Handhelds and Mobiles.

Anli has a collection of dual band antennas for VHF and UHF applications. There are handheld, mobile, and base station versions along with a collection of accessories and mounts. The antennas are shown in the table below.

Model	Description	HRO Price
	HT Antennas	
AL-800	2m/70cm 3.2/5.6 dB gain. 50 watt capability . 2 in 1 model. w/gold BNC. Black chrome plated.	$36.95
RD-8H	2m/70cm 10 watt capability. Flexible whip.	$16.95
S-1	2m/70cm 0/3/2 dB. 50 watt capability.	$23.95
	Mobile Antennas	
AT-2	2m/70cm 3.8/5.6 dB. 200 watts. 2'3" tall. UHF connector.	$49.95
AT-3	2m/70cm 2.15/3dB dB. 150 watts. 17" tall. Black Chrome Finish. UHF connector.	$24.95
AT-4	2m/70cm 3/5.5 dB gain. 200 watt capability. UHF or NMO mount (specify with order)	$49.95
	Mounts	
CM-1	Side mirror clip mount with BNC connector. 8' coax cable.	$18.95
CM-2	Side mirror clip mount with adjustable BNC connector 8' coax cable.	$14.95
WA-1	Window/sun roof clip mount with BNC connector. 8' coax cable.	$16.95
MC-1	Hi-Flux magnetic mount with RG-58C/U super high quality cable.	$19.95
TA-1	Trunk mount with RG-58C/U super high quality cable.	$19.95
	Base Antenna	
A-1000	Base Antenna 2,/70cm. 8.5 dB (2m) 11.8db(70cm) Gain. 310 watts. 17.5" Tall	$179.95

MAXRAD

These quality VHF / UHF antennas are now available. Please call for models, specifications, and quotes.

2m / 70 cm Dual-Band Antennas

When the mobile radios used with the dual-band antennas have an output for 2 meters and a separate output for 440 MHz, it is necessary to use a duplexer when using a single antenna. The Kenwood MA-700 comes with a duplexer. Optional duplexers are available from Larsen, Yaesu, Diamond and Comet.

In addition to the antennas in the chart below, there are more dual-band antennas on the following pages:

DIAMOND ANTENNA **See Page100**

COMET **See Page106**

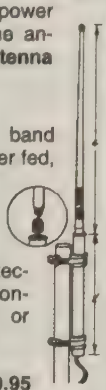
Valor **See Page108**

Dual Mobile Antennas

Brand	Model	Type	Frequency MHz	Gain	Weight oz.	HRO Price
Icom	AH-32	2m	144-148	2.7 dB	8.8	$54.95
		70cm 5/8 collinear	440-450	5.5 dB		
Kenwood	MA-700	2m 1/2 whip	144-148	3.0 dB	7	$94.95
		70cm 5/8 stacked	440-450	5.5 dB		
Larsen	NMO 2/70	2m	144-148	2.6 dB	3.9	$46.65
		70cm 5/8 collinear	440-450	5.5 dB		
Austin	500C	2 m	144 -148	Unity	6	$32.95
		70 cm	440 - 450			
	Metropolitan	2 m	144 -148			$39.95
		220 MHz	220 - 225	Unity	6	
		70 cm	440 -450			

AUSTIN ANTENNA

Ferret multiband scanner antenna is an array of tuned elements providing state-or-the-art performance from 30 to 1300 MHz. Use of dielectrically tuned chokes, multi-tuned parallel resonant circuits and asymmetrical elements yields resonances at 40, 100, 122, 146, 310, 465, 865 and 1280 MHz. Housed in a neat white lightweight fiberglass radome, an aluminum mounting tube is provided for easy installation to a mast or side brackets. Termination is an N connector. For extended reception, a 10 dB broadband preamp module with matching variable voltage power supply that mounts at the antenna is available. **HRO Antenna Price $249.95**



Suburban 3 and 4 band base antennas have center fed, half wave radiators decoupled by a resonant cavity and housed in a slim, attractive white fiberglass radome for protection against harsh environments. No ground plane or field adjustments needed.

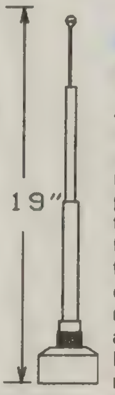
HRO Prices:
144, 222, 440 MHz $69.95
144, 222, 440, 1280 MHz $109.95
50, 144, 222, 440 MHz $169.95

Condor is a true multiband flexible with tuned 1/4 wave elements for high band VHF, UHF, and 800/1000 MHz. The BNC connector is imbedded in the high density urethane housing to withstand the roughest handling. Replace that stock rubber ducky and pull in the weak signals. **HRO Price $29.95**

DFQ is a monoband, center fed, stacked 5/8 wave antenna housed in a fiberglass radome for maximum survivability. A perfect portable or base antenna. Available for all amateur frequencies 2 meters to 1.3 GHz and beyond. **HRO Prices: 144 MHz $64.95;**
222 MHz $59.95
440 MHz $59.95

Multiplexers for simultaneous unswitched operation with separate radio systems. Superbly made band pass filter ports have less than 0.5 dB insertion loss and port-to-port isolation that exceeds 50 dB. Match all Austin multiband antennas. Fabricated in rugged, irridited aluminum housings, with N-type connectors for constant impedance and minimum loss. **HRO Prices: Triplexer $130.00**
Quad-plexer $170.95
Pentaplexer $199.95

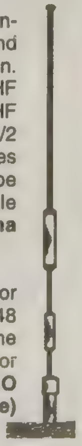
500C dual band mobile antenna covering 2 meters and 70 cm, uses patented resonant cavity techniques to achieve high performance and simultaneous match for multiband operation. The UHF element is a ground independent 1/2 wave radiator. In VHF operation, an offset-fed 1/4 wave element uses the vehicle as a ground plane to lower the usually high radiation angle of a 1/4 wave antenna. Only 19" tall, the antenna will not bend over at highway speeds. Performance exceeds that of a typical 5/8 wave design at highway speeds. **HRO Price $32.95**



Metropolitan mobile multiband antennas employ a unique Austin patented design, using state-of-the-art resonant cavity techniques to achieve high performance and simultaneous match for VHF/UHF multiband operation. All elements are end fed 1/4 wave elements using the vehicle as a ground plane. Decoupling of each element is by means of the resonant cavity, which also produces a 50 ohm match. This isolation produces a superior radiation pattern that provides great performance on all bands. The tribander covers 144, 222, and 440 MHz. The quadbander adds 1280 MHz.

HRO Prices: Tribander $39.95
Quadbander $49.95

Pentenna is a five band mobile which adds either 10 or 6 meters (your option). **HRO Price $199.95**



Spectra multiband antenna is a patented 4 band tuned mobile or base design. It covers low and high VHF with 1/4 wave elements, UHF and 800/1000 MHz with 1/2 wave elements. It is 33 inches long and has a Motorola type connector for easy mobile mounting. **HRO Antenna Price $84.95**

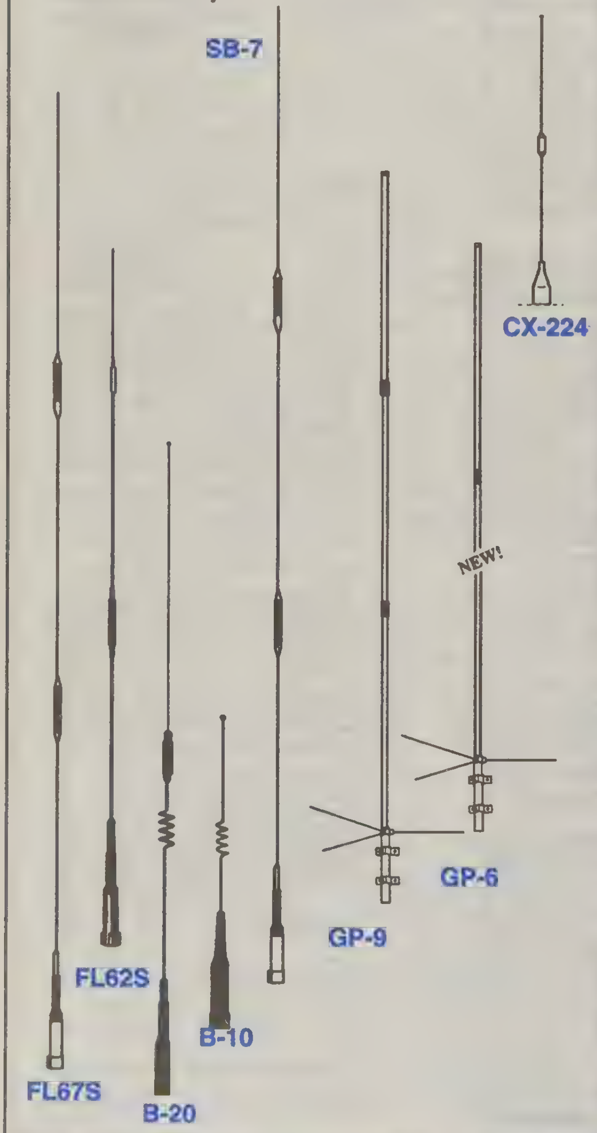
A pole mount is available for base station usage. At 48 inches long, it increases the VHF elements to 1/2 wave for enhanced performance. **HRO Price (Antenna and Pole) $139.95**

COMET

Dual / Triband VHF / UHF Antennas

Comet developed the Super Linear Converter (SLC) System to increase the actual gain of Dual and Triband antennas.

- A complete pre-formed phasing coil and phosphorus copper element eliminates additional components and gain loss.
- The SLC is electrically very efficient, providing a low angle of radiation, directly to the horizon, for maximum performance.
- Comet sectional antennas use ABS (Transparent to RF) connecting joints for the finest pattern and easiest assembly.



Comet Dualband Antennas

MODEL	BANDS	GAIN	MAX PWR Watts	CONN	WGT Lbs' oz"	LEN FT' In"	MAX WIND SPEED MPH	Sugg. List
Dual Band Base Station Repeater Antennas								
GPX-2010	2m/70cm	9.5/13.2	200	SO-239	7'14"	23'4"	65 w/o guys 90 w/guys	$395.95
GP-9N	2m/70cm	8.5/11.9	200	SO/N	5'11"	17'8"	90	$219.95
GP-6	2m/70cm	6.5/9.0	200	SO-239	3'8"	10'5"	90	$174.95
GP-3	2m/70cm	4.5/7.2	200	SO-239	2'12"	5'11"	112	$121.95
CA-350DB	10m/6m	2.15/6.5	100 FM	SO-239	7'8"	22'7"	65	$284.95
CA-1243Z	70cm/23cm	9.4/12.8	150/50	N-Female	3'8"	7'5"	90	$161.95
CA-1243E	70cm/23cm	6.0/8.4	150/50	N-Female	1'13"	3'4"	112	$94.95
Dual Band Mobile Antennas - B Series - Black Anodized								
B-10	2m/70cm	–/2.15	50	PL-259	–	12"	–	$38.95
B10NMO								$38.95
B-20	2m/70cm	2.15/5.0	50	PL-259	–	30"	–	$54.95
B20NMO								$54.95
F Series: The highest Quality Dual Band Antenna You Can Buy								
FL-62S	2m/70cm	3.6/6.0	150	PL-259	–	3'5"	–	$79.95
FL-67S	2m/70cm	4.5/7.2	150	PL-259	–	4'11"	–	$96.95
SB-7/SB-7NMO	2m/70cm	4.5/7.0	70	PL/NMO	–	4'7"	–	$82.95
SB-5/SB-5NMO	2m/70cm	3.0/5.5	120	PL/NMO	–	3'2"	–	$58.95
SB-2/SB-2NMO	2m/70cm	2.15/3.8	100	PL/NMO	–	20"	–	$35.95
CA-214W	2m/220MHz	1.7/3.4	100	PL-259	–	2'11"	–	$62.95
CHL-350	10m/6m	–/2.15	200	PL-259	–	7'0"	–	$71.95

Comet Triband Antennas

MODEL	BANDS	GAIN	MAX PWR Watts	CONN	WGT Lbs' oz"	LEN FT' In"	MAX WIND SPEED MPH	Sugg. List
TriBand Base Station Repeater Antennas								
GP-15	6m/2m/70cm	2.15/6.2/8.4	200	SO-239	2'15"	7'11"	90	$159.95
GP-93	2m/70cm/23cm	4.5/7.2/10	200	N-Female	2'8"	5'7"	112	$149.95
GP-98	2m/70cm/23cm	6.5/9.0/13.5	100	N-Female	3'6"	9'4"	90+	$229.95
CX-333	2m/220/70cm	6.5/7.8/9.0	120	SO-239	3'10"	10'2"	112	$214.95
TriBand Mobile Antennas								
FL-15S	6m/2m/70cm	2.15/4.5/7.2	120	PL-259	–	4'10"	–	$89.95
CX-801	2m/70cm/23cm	3.0/6.8/9.6	100	N-Male	–	3'3"	–	$84.95
CX-224	2m/220/70cm	2.15/3.2/5.5	150	PL-259	–	3'1"	–	$79.95
CS-224NMO	2m/220/70cm	2.15/3.2/5.5	150	N-Male	–	3'1"	–	$79.95
CA-HV	40/(20)/15/10	1/4 Wave	120 SSB	PL-259	MAX 1'3"	MAX 6'3"	–	$129.95
L-14	Opt 20M coil fo CA-HV						–	$29.95
HA-4S	40/(20)/15/10/ 6/2m	HF-/2.25/3.4	150 SSB	PL-259 /NMO		4'4"	–	$179.95
L-14HS	Opt 20M coil fo HA-4S						–	$39.95

Comet Single Band and HT Antennas

MODEL	BANDS	GAIN	MAX PWR Watts	CONN	LEN FT'In"	HRO Price
Single Band Antennas						
SB-25/SB-25NMO	2m	4.1	100	PL-259/NMO	4'8"	$49.95
SB-44	70cm	5.5	130	PL-259	37"	$44.95
HT Antennas						
CH-32 MINI Ant	2m/70cm	–	10	BNC	1.75"	$33.95
CH-72S	2m/70cm	–/3.2	50	BNC	15"	$32.95
SH-95	2m/70/23cm	1.5/2/5.5	10	BNC	15"	$49.95

Comet High-Power Duplexers and Triplexers

Zinc-alloy, die-cast, twin cavity, low input loss, high-isolation, and high-power. Modernize your station with Comet high-performance antenna products.

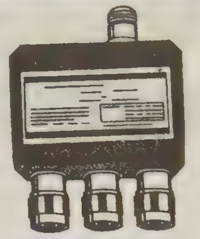
MODEL	PORT	Freq MHz	C W Watts	PEP Watts	Loss dB	Isol dB	Mix Conn	Port Conn	HRO Price
CF-416A (2m/70cm)	LPF HPF	1.3-150MHz 400-540MHz	450 300	800 500	0.15 0.25	60 60	SO-239	PL-259 w/leads PL-259 w/leads	$58.95
CF-416C (2m/70cm)	LPF HPF	1.3-150MHz 400-540MHz	450 300	800 500	0.15 0.25	60 60	N-Female	PL-259 w/leads N-Male w/leads	$58.95
CF-4160I (2m/70cm)	LPF HPF	1.3-150MHz 400-540MHz	450 300	800 500	0.1 0.2	60 60	SO-239	PL-259 w/o leads N-Male w/o leads	$52.95
CF-4160K (2m/70cm)	LPF HPF	1.3-150MHz 400-540MHz	450 300	800 500	0.1 0.2	60 60	SO-239	PL-259 w/o leads PL-259 w/o leads	$52.95
CF-413B (70cm/1.2GHz)	LPF HPF	1.3-150MHz 350-500MHz 840-1.4GHz	450 300 100	800 500 200	0.25 0.25 0.4	55 55 55	N-Female	PL-259 w/leads N-Male w/leads	$68.95
CF-413OA (70cm/1.2GHz)	LPF HPF	1.3-150MHz 350-500MHz 840-1.4GHz	450 300 100	800 500 200	0.2 0.2 0.3	55 55 55	N-Female	N-Male w/o leads N-Male wo leads	$69.95
CF-360A (10m/6m)	LPF HPF	1.3-30MHz 50-240MHz	350 350	600 600	0.2 0.2	45 45	SO-239	PL-259 w/leads PL-259 w/leads	$69.95
CF-142 (2m/220MHz)	LPF HPF	1.3-1150MHz 220-480MHz	300 200	600 400	0.2 0.3	40 50	SO-239	PL-259 w/leads PL-259 w/leads	$64.95
CFX-431A (2m/70cm/1.2)	LPF - BPF HPF	1.6-60MHz 100-150MHz 350-500MHz 840-1.4GHz	600 450 300 100	1KW 800 500 200	0.2 0.2 0.3 0.4	50 50 50 50	N-Female	PL-259 w/leads - N-Male w/leads N-Male w/leads	$81.95
CFX-4310B (2m/70cm/1.2)	LPF - BPF HPF	1.6-60MHz 100-150MHz 350-500MHz 840-1.4GHz	600 450 300 100	1KW 800 500 200	0.15 0.25 0.25 0.3	50 50 50 50	N-Female	PL-259 w/leads - N-Male w/leads N-Male w/leads	$82.95
CFX-4310C (2m/70cm/1.2)	LPF - BPF HPF	1.6-60MHz 100-150MHz 350-500MHz 840-1.4GHz	600 450 300 100	1KW 800 500 200	0.15 0.25 0.25 0.3	50 50 50 50	N-Female	PL-259 w/leads - N-Male w/leads N-Male w/leads	$82.95
CFX-514 (6m/2m/70cm)	LPF BPF HPF	1.3-90MHz 130-200MHz 380-500MHz	450 450 300	800 800 500	0.2 0.25 0.3	55 55 55	SO-239	PL-259 w/leads PL-259 w/leads PL-259 w/leads	$75.95
CFX-514J (6m/2m/70cm)	LPF BPF HPF	1.3-90MHz 130-200MHz 380-500MHz	450 450 300	800 800 500	0.15 0.2 0.25	55 55 55	SO-239	SO-239 w/o leads SO-239 w/o leads SO-239 w/o leads	$75.95
CFX-324A (2m/220/70cm)	LPF BPF HPF	1.3-150MHz 200-320MHz 390-500MHz	350 350 350	600 600 600	0.2 0.25 0.3	40 40 40	SO-239	PL-259 w/leads PL-259 w/leads PL-259 w/leads	$99.95
CFX-324B (2m/220/70cm)	LPF BPF HPF	1.3-150MHz 200-320MHz 390-500MHz	350 350 350	600 600 600	0.2 0.25 0.3	40 40 40	SO-239	PL-259 w/o leads PL-259 w/o leads PL-259 w/o leads	$95.95

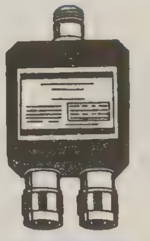
Comet Mobile Mounting Systems

Comet has a wide variety of mobile moounts. Choose the mount and coax cable assembly that best fits your personal needs. All Comet cables have detachable connectors.

MODEL	DESCRIPTION	HRO Price
3D4M	Standard coax assy. 13ft low loss (3.5mm) coax w/UHF Connectors	$23.95
3D4N	-Ditto- But with N-Type Connectors	$24.95
CK-5M	13ft VERY low loss (5mm) cable + RG-188 to avoid water leak/cable damage. UHF Conn.	$37.95
CK-5N	-Ditto- But with N-Type Connectors	$39.95
5D4N	13ft VERY low loss (5mm) cable assy. For 1.2GHz. N-Type Connectors	$29.95
The following Mounts are w/o Coax. Choose from the Cable Assembly Above.		
RS-80	Presitge Heavy-Duty Gutter Mount. Black w/Dail lock.	$29.95
RS-81	Presitge Heavy-Duty Trunk Lip Mount. Black w/Dail lock.	$29.95
RS-21	Multi-Purpose Mount, Trunk-Lip/Hatch-Back, Black, Adj to any position	$29.95
RS-9	Trunk-Lip Mount, Black. For small antennas. (B-10, B-20, CHL-23J, etc)	$14.95
MS-3FVMM	Mag Mount, 13ft low-loss (3.5mm) cable. 12 pole magnet. UHF Connectors	$39.95
MS-5LXMM	Mag Mount, 13ft low-loss (5mm) cable + Rg-188 to avoid water leak/cable damage	$56.95
MS-5LXNN	-Ditto- But with N-Type Connectors	$59.95
GR-5M	Deluxe trunk-lip mount w/CK-5N Cable, N-type connectors	$65.95
GR-5N	Deluxe trunk-lip mount w/CK-5N Cable, N-Type connectors	$65.95

GP-98

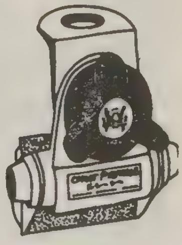

CFX-4310C

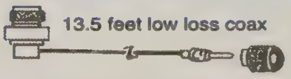

CF-4160K

CF-416A

CFX-431A

RS-80

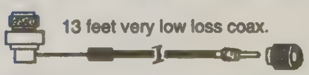

RS-81



3D4M(N)

Detachable Connector

RG-188 provides easy entry into the vehicle from an exterior mount.



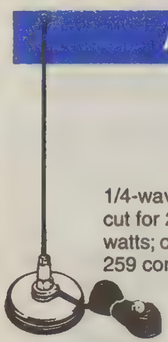
10 inches RG-188

CK-5M(N)

Detachable Connector

Valor

Antenna Mounts



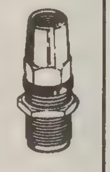
VHF 1/4 Wave Magnetic Mount Kits

Model VAA-002

1/4-wave magnetic mount antenna for 2 meters. Can be cut for 220 or 450 MHZ. 17-7 stainless steel whip; 100 watts; complete with 12-foot Valor-Flex™ cable and PL-259 connector. **HRO Price $23.95**

Model VAA002BNC

Same antenna as VAA002, except with BNC connector. **HRO Price $27.95**



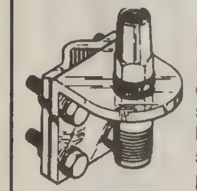
Model 105AD

Mount Assembly: Heavy duty 3/8 SO-239 Connector, nickle plated. No chance of rust or corrosion. The brass hex is chrome plated. For plug-to-plug connections. **HRO Price $5.99**

Window Mount Kit

Model WMSLBNC

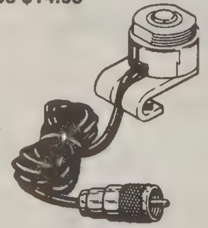
Slim Line window mount kit with BNC connectors and 7' RG188 cable. Easily mounted to any vehicle window. Features slimline, black finish window mount BNC connectors and high tech design. Ideal for handheld radios for Amateur, CB, scanner and commercial users who need extra performance. **HRO Price $34.95**



Stainless Mount

Model SSI00AD

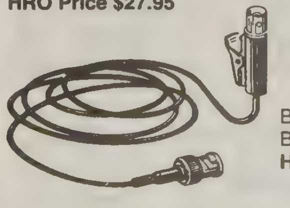
Stainless Steel 3-Way Mount: Heavy-duty 3/8 S0-239 connector. Mounts horizontally, vertically, or flush. Heavy gauge bright stainless steel bracket and back plate. All stainless steel hardware and chromeplated brass hex. Fits all standard 3/8-24 antennas up to 48". For plug to plug hookups. **HRO Price $14.95**



Trunk Lip Mounting Kit

Model PAT2

This is a low profile, no-hole trunk mount. This mount features the Mototola Style 1-1/8"-18 thread for amateurs who demand the very best and professional quality. **HRO Price $27.95**



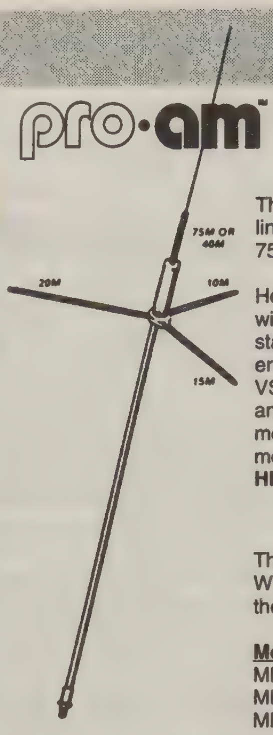
Hat Clip

Model BNC-HC

BNC Hat Clip with 4' of Cable and BNC Connector. **HRO Price $14.95**

HRO Now Has 12 Full-Service Stores
Nationwide to Answer Your
Ham Radio Needs

pro·am™



HF Mobile Antennas

Model AB5

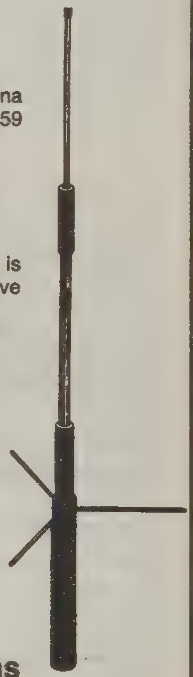
The Pro-Am HF mobile series are heavy-duty, slimline construction, designed for the HF amateur bands 75M, 40M, 20M, 15M, and 10M.

Heavy-gauge copper wire wound on 3/8" fiberglass, with nickel-chrome brass fittings and 17-7 taper ground stainless steel whips assure dependable mobile operation. The 4' S.S. whip is field tunable for lowest VSWR and double locked with S.S. set screws. The antenna features 3/8-24 ferrule to fit standard mobile mounts. Power rated at 250 watts P.E.P. for top mobile performance. Approx. 8' lenqth.
HRO Price $109.95

The Micro Mag

This is a series of compact VHF and UHF antennas. With their stylish, trim and petite profiles, they are just the antenna for today's mobile ham. Models include:

Model	Description	HRO Price
MM144B	2 meters	$44.95
MM450B	440-450 MHz	$44.95
MM270B	Dual Band	$49.95



Glasmaster™ Glass Mount Antenna

The model GM270 is a dual-band, on-glass mounted antenna for 2 meters and 440 MHz. It comes with 14' RG58 with a PL-259 connector. **HRO Price $59.95**

Dual-Band Base Station Antenna

Model DB240 for 2 Meters / UHF

Extra heavy-duty 144 / 450 MHz base station antenna is designed for the amateur user who appreciates innovative design. The DB240's compact size gives big performance.

Specifications	2 Meter	UHF
MHz frequency:	144-148	435-450
SWR 2:1 band width	>10 MHz	>20 MHz
Gain	3.11 dbi	7.18 dbi
Power FM	250 Watts	250 Watts
Mounting mast diameter	1.25" maximum	
Overall length	40"	
Radial length	20.5"	
Radials	Aluminum	
Loading coil housing	Weather Sealed Black PVC	
Hardware	Stainless Steel "N" Connector	
HRO Price	**$89.95**	

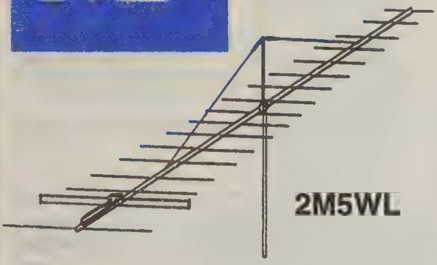
PA Base Repeater Antennas

The new PA Repeater Antennas feature a wide-band range; VSWR 1.5:1; factory adjusted, no tuning required; weatherproof; stainless steel radials and hardware; UPS shippable; 200 watt power rating; UHF connectors; rugged white fiberglass; wind speed ratings in excess of 90 mph.

Part #	Gain (dB) 2m	Gain (dB) 70cm	Lgth (in.)	Wind Rating (mph)	Element Phasing	HRO Price
PA555	8.3	11.7	204.7	90	2m:3-5/8, 70cm:8-5/8	$179.95
PA255	6	8	98.4	112	2m:2-5/8, 70cm:4-5/8	$139.95
PA55	4.5	7.2	67	135	2m:5/8, 70cm:3-5/8	$79.95

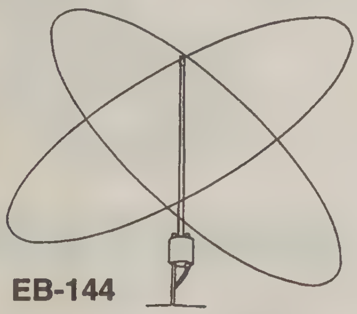
M^2

MORE ANTENNAS



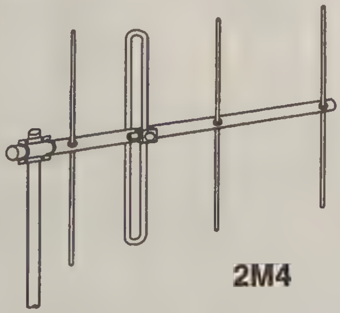
2M5WL

The 2M5WL is designed with the serious DXer in mind. It provides maximum gain for minimum weight and yet windload is strong enough to survive 100 mph winds. The driven element is also unique as its center is machined from a block of aluminum and fitted with 'O' ringed connectors and access cap. After factory assembly, the housing is filled with a space age silicon material. The antenna is widely used in EME and large tropo scatter arrays.



EB-144

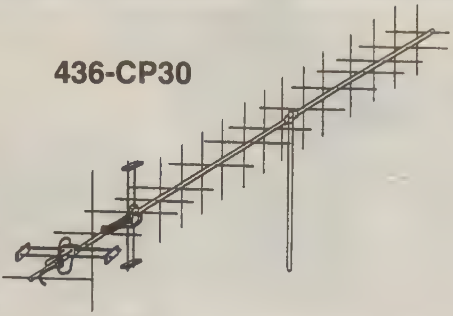
The EB-144 Eggbeater offers exciting new performance characteristics for both fixed and mobile operations. The EB-144 produces smooth omnidirectional horizontal polarity at the horizon. Above the horizon, the pattern transforms to right hand circular off the top making it a natural for OSCAR use. No rotation or steering is required.



2M4

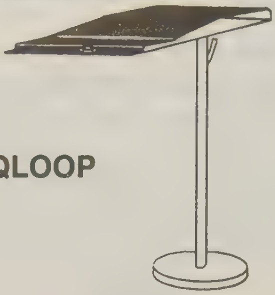
The 2M4 features a clean mechanical design, full-band coverage and computer optimized performance. These make it an exceptional antenna. A totally sealed and grounded driven element design with a unique internal balun provides the heart that will beat for years to come. It is perfect for base and portable use, with FM, Packet or SSB. Every station needs one.

436-CP30



The 436-CP30 is a practical size yet high-performance circular polarized antenna with a remarkably clean pattern. The pattern is important in order to match the antennas noise temperature with today's low noise preamps. This antenna is ideal for satellite work but is also excellent for terrestrial uses like ATV, repeater operation and long haul tropo DX.

2M SQLOOP



The SQLOOP is an omnidirectional Horizontally polarized antenna designed for mobile and base use. The SQLOOP for 2 meters is a flat 8" square, reduced size loop, cut out of one piece of aluminum to minimize loss. The basic 2 ohm impedance of the loop is efficiently balance fed with an inductive, magnetically shielded coupling loop.

Model	Frequency Range MHz	Gain	Front to Back	Wind Area sq ft	Boom Length ft	Turning Radius ft	Sugg. List
6 Meters							
6M SQLOOP	50-54	4.8	Omni	0.13	NA	NA	$97.95
6M5	50-50.5	9.2	12	2	15.75	9.5	$149.95
6M7	49.5-50.5	10.5	23	3	26.75	14.5	$229.95
6M2WL	50.1	12.1	>25	5	39.5	20.4	$379.95
6M2.5WL	50.1	12.7	>22	5.9	50.33	26	$449.95
2 Meters							
2M SQLOOP	144-144.5	4.8	Omni	0.074	NA	NA	$59.95
EB-144	144-148	1	Omni	0.17	NA	NA	$119.95
2M4	144-148	7.5	20	0.5	4	4	$59.95
2M7	144-148	10.3	20	0.74	8.8	4.5	$105.95
2M12	144-148	13	25	1.5	19.5	9.5	$129.95
2M5WL	144-148	14.8	22	2.7	33	18.78	$169.95
2MCP14	144-148	10.3	20	1.1	10.5	6	$149.95
2MCCP22	144-148	12.5	25	2.5	18.6	10	$225.00
2M8WL	144-146	16.67	24	5.8	52.8	27	$289.95
2 m - 70 cm Dual-Band							
2M5-440XP	144-148/430-450	9 & 12	15 & 25	1.1	5	2.5	$149.95
220 MHz							
222-7EZ	220-226	9.8	22	0.5	5.66	5.8	$99.95
222-7WL	220-226	16.4	25	2.7	32.5	18	$189.95
222-10EZ	220-226	12	23	0.7	9.75	5.5	$99.95
70 cm							
EB-432	420-450	1	Omni	0.083	NA	NA	$109.95
420-50-5	420-450	7.8	20	0.33	2.166	2.1	$89.95
420-50-11	420-450	11.3	23	0.5	5	2.5	$89.95
440-18	420-455	23	23	0.875	11.33	6	$109.95
436CP30	430-440	14.5	24	1	9.75	5	$229.95
432-9WL	420-440	17.3	24	1.6	21	11	$149.95
432-13WL	430-434	18.6	24	2.5	21	10.5	$229.95
900 MHz and Above							
902-14WL	895-910	19	25	1.2	15.3	8	$169.95
23CM22EZ	1250-1300	16	0.3	0.3	5.33	3	$89.95
23CM35EZ	1250-1300	18.4	25	0.06	10	5.5	$119.95
13CM40EZ	2300-2402	18.2	21	0.26	5.5	3	$109.95

YAESU ROTATORS

Yaesu's high quality rotators for amateurs include models for medium to large arrays and for satellite work. There are also provisions for computer control. Contact your nearest HRO for more specifications and low, discount prices on Yaesu products.

G-2700SDX

The G-2700SDX is a high-technology rotator designed to turn the largest tower-mounted antenna arrays.

G-500A

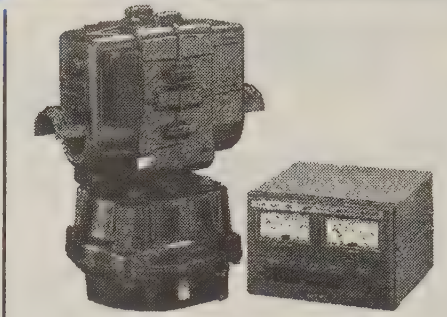
This is an elevation rotator for satellite work. The control box shows elevation in degrees.

G-800S / G-800SDX

The G-800 rotor series is designed for medium to heavy loads and antennas up to 20 square feet. The G-800SDX is the same as the G-800S with the addition of presets.

G-1000SDX

The G-1000SDX is designed to handle bigger arrays, up to 22 square feet. A great value.



G-5400B

This is the most popular azimuth and elevation rotator for satellite, moonbounce or any other space communications work. It is a combination of the G400 and G500 rotators providing both horizontal and vertical antenna rotation in a single unit. The control box has two large meters, one showing elevation and the other showing azimuth. Meter aiming accuracy is within ±4%. The G-5400B provides for full 180° elevation rotation with a rotation time of 58 seconds. A full 360° azimuth rotation can be achieved in just 50 seconds. This rotator will accept up to a 2.5" mast, a maximum 1-5/8" horizontal cross-boom and 440 pounds of vertical load. **Suggested List Price $529.95**

Rotator Separation Kit GC-038

For some applications it is desirable to separate the azimuth from the elevation rotator on the tower. This separation kit provides all the hardware for the rotator to implement this separation. **HRO Price $27.95**

Rotator Computer Controllers

The GS-23 Rotator Computer Controller is for the G-800SDX, G-1000SDX and G-2700SDX.
Suggested List Price GS-23 $345.95

The GS-232 model is for the G-5400.
Suggested List Price GS-232 $547.95

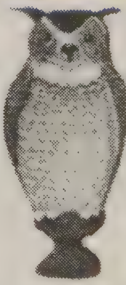
hy-gain

The most popular rotators are those from Hy-Gain. These were made originally by CDE until they were purchased by Hy-Gain. All are bell type rotators and require 8 wire rotator cable.

The models from the smallest to the largest are: **AR40, CD45II, HAM IV, T²X** (Tailtwister) and **HDR-300**. See the chart on the previous page for specifications of each model.

All Hy-Gain rotators except the two smallest, the AR40 and CD45II, require an extra adapter for mast mounting. Please note that the heavy-duty model HDR-300 can only be mounted on a flat surface.

The OWL



Want to keep those birds off your antenna system? The OWL is just the trick. Mount this fella on top of your tower and the birds will stay away.

HRO Price $19.95

Rotator Specifications

	Model	Input Voltage	Motor Voltage	Rotation Time	Stationary Torque	Rotation Torque	Maximum Windload	Max. Vert Load	Max. Mast Size	Cable Type	Weight lbs (kg)	Sugg. List
Hy-Gain	HDR-300	110/220 V	24 VAC	60 sec	7500 in lbs	5000 in lbs	25 sq ft	500 lbs	3 in	7-wire	55 (25)	$1,380.95
	T2X	110 V *	24 VAC	60 sec	9000 in lbs	1000 in lbs	20 sq ft	800 lbs	2.06 in	8-wire	28 (12.7)	$613.95
	HAM-IV	110 V *	24 VAC	60 sec	5000 in lbs	800 in lbs	15 sq ft	500 lbs	2.06 in	8-wire	24 (11)	$515.95
	CD-45II	110 V	24 VAC	60 sec	800 in lbs	600 in lbs	8.5 sq ft	200 lbs	2.06 in	8-wire	22 (10)	373.95
	AR-40	110 V	24 VAC	60 sec	450 in lbs	350 in lbs	3 sq ft	100 lbs	2.06 in	5-wire	14 (6.4)	$260.95
M 2	OR-2800	110/220 VAC	28 VAC	70 sec	17,000 in lbs	2500 in lbs	35 sq ft	1800 lbs	3 in	8-wire	28.5 (13)	$1,099.95
Yaesu	G-800S	110 VAC	24 VAC	55 sec	3456 in lbs	43-79 ft lbs	20 sq ft	440 lbs	2.5 in	6-wire	10 (4.5)	$359.95
	G-800SDX	110 VAC	24 VAC	55 sec	3456 in lbs	43-79 ft lbs	20 sq ft	440 lbs	2.5 in	6-wire	10 (4.5)	$439.95
	G-1000SDX	110 VAC	24 VAC	55 sec	5200 in lbs	79 ft lbs	22 sq ft	440 lbs	2.5 in	6-wire	15 (6.8)	$539.95
	G-2700SDX	110 VAC	24 VAC	55 sec	20,832 in lbs	219 ft lbs		880 lbs	2.5 in	6-wire		$1,049.95
	G-500A	110 VAC	24 VAC	61 sec	1740 in lbs	876 in lbs	11 sq ft		1.5 in	6-wire	5.5 (2.5)	$299.95

* 220 VAC models are available at additional costs

OR-2800

The M² Orion OR-2800 antenna rotator is engineered for long life, reliability and performance while turning large antennas or systems. New features include a strong ductile iron mast clamp, larger drive plate for up to 3" masts, extended and hardened drive shaft and prop-pitch style torque plate. The powerful motor and large heat-treated gears provide even higher rotational torque. The rotator housing fits inside most popular towers and mates to standard tower/rotor plates.

The RC2800 Control Box features digital readout, variable speed control, slow start, and reverse delay. The RC2800P adds programmability, preset, 2 rotator capacity, slow-start/coast-down, true AZ readout-continuous and infinite limit position control.

For larger antenna systems there is the optional PTA-1 Peak Torque Absorber unit which reduces instantaneous torque stresses to mast, tower, boom and rotator.

The OR-2800 carries a 1 year warranty and is available from any HRO store. The unit is made in the U.S.A. **Sugguested List $1099.95**

OR-2800 Specifications

Wind Area Capacity	35 sq ft
Starting Torque	3500 in lbs
Rotating Torque	2500 in lbs
Breaking Torque	17000 in lbs
Vertical Load Capacity	1800 lbs
Mast Size (O.D.)	1.75-3"
Rotational Speed (360)	70-140 sec
Readout Accuracy	1 degree
Input Voltage	110/220 AC 50/60 Hz
Motor Voltage	28 VAC
Cable Type	8 conductor
Weight (Rotator unit)	28.5 lbs

OR-2800 Accessories

Model	Description	Sugg. List
OR-FMI	Flex Mount for Misaligned Masts	$59.00
OR-LMBI	Lower Mast Bracke for OR-2800	$159.00
OR-PSI	Preset Option for OR-2800	$139.00

Rotator Cable

HRO carries three **Belden rotator cables**. Use standard duty cable for runs up to 100 feet. For longer runs, please use heavy duty cable. Remember, Belden quality is **tops** in the industry

4 wire - Model 8444 - 4 wire cable using 4 - #22 tinned copper conductors, PVC insulated.

8 wire, standard duty - Model 8448 - 8 wire cable using 6 - #22 and 2 - #18 tinned copper conductors. PVC insulation; chrome PVC jacket.

8 wire, heavy duty - Model 9405 - 8 wire cable using 6 - #18 m and 2 - #16 tinned copper conductors. PVC insulation; chrome PVC jacket.

When Ordering Cable

Please order the cable in multiples of 50 feet. Lengths up to 1000 feet in a continuous spool can be provided.

Connectors

Connect Works

Model	Description	HRO Price
B-112XC	BNC for RG-b/X Gol Pin	$3.99
BU-312	BNC to UHF Adaptr (BNC-255)	$5.99
NU-312	N to UHF Adaptr (4400)	$9.99
SB-312	SMA to BNC Adaptr (for T-21A)	$9.99
U-245C	4 hole SO-239 Chassis Connector	$1.99
U-311	Double Male UHF (83-877)	$6.99
U-322	UHF Barrel (83-1J)	$4.99
U-332	Long UHF-UHF Barrel (83-1F)	$6.99
U-412	RT. Angle Teflon, Gold Pin (83-1AP)	$8.99
U-512C	UHF "T" (83-1T)	$6.99
UB-312	BNC to UHF Adaptr (31-28)	$6.99
UN-312	UHF to N Adptr (14000)	$15.99

Call for HRO Discount Prices

Coax

Coax can be purchased in any length up to 1000 feet. 1000' continuous lengths of 9913, 8214 and 8267 must be sent by truck. **Call for Belden quotes.**

8214 - RG8 / U

8214 is a standard RG8 / U, #13 stranded copper center conductor, cellular polyethylene insulation, 97% bare copper shield, PVC jacket, 50 ohm impedance, 78% velocity factor and 1.8 dB loss per 100' at 100 MHz. The most popular cable for HF and VHF / UHF. Use when long cable runs are not required.

8267 - RG213 / U

8267 is an RG-213 / U coax, #13 stranded copper center conductor, solid polyethylene insulation, 97% bare copper shield, non-contaminating PVC jacket, 50 ohm impedance, 66% velocity factor and 2.2 dB loss per 100' at 100 MHz. This RG-8 type cable is best for HF use and may be buried.

9913

9913 is RG8-type coax, #9.5 solid copper conductor, semi-solid polyethylene insulation, 100% foil plus 88% braid shield, PVC jacket, 50 ohm impedance, 84% velocity factor and 1.4 dB loss per 100' at 100 MHz. The best cable for VHF and UHF applications.

9258 - RG8X

RG8X is small diameter coax, #16 stranded copper center conductor, cellular polyethylene insulation, 95% bare copper shield, PVC jacket, 50 ohm impedance, 78% velocity factor and 3.7 dB loss per 100' at 100 MHz. Good for short VHF runs and most HF uses.

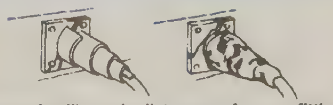
9356 - RG8 / U

100' roll of 8214 RG8 / U coax with PL-259 connectors (crimp type) installed on each end for your convenience.

8000

14 strand "copper weld" bare copper wire. Great for long wires or dipole. High tensile strength.

COAX-SEAL



Coax-seal will seal all types of coax fittings, baluns, antenna parts and connectors of any shape. Adheres to most surfaces. Wrap Coax-seal around the object you want to protect and then mold it into shape. Keeps moisture out of the coax fitting on antenna feed lines. Need to make a change? Just remove it and start over.

MA-SERIES CRANK-UP MASTS

The premier MA-Series crank-up Tubular Towers are designed to be both safe and neighbor friendly. The slender design gives a Clean, flagpole-like appearance, while allowing for antennas up to 10 sq. feet in 50 mph winds. Per EIA Specifications, adequate safety margins are included. Uniform Building Code calculations are available for most models.

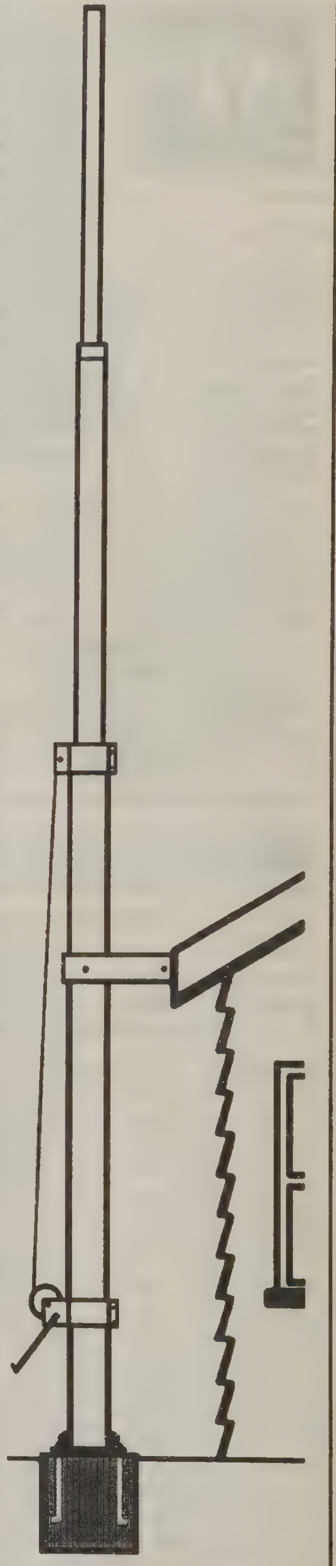
The MA-40 and 550 models come standard with flat base. two 1/2" x 10" anchor bolts, wall bracket and rotor plate mounted on top of top section. No guying is required when tower is properly bracketed to the eve of your roof.

MA-Series towers are completely self-supporting only when used with accessory MARB or MAB Series bases. The MARB Series rotor base allows the entire tower and antenna to be rotated from the base (rotor not included). This provides for easy rotor maintenance plus emergency hand rotation of the entire tower and antenna.

The MA-550MDP, 770MDP and 850MDP models include a heavy duty motor drive with positive pull down. The MDP models provide motorized raising and lowering of the tower. A remote control unit (RMC-1000) accessory is available that allows raising and lowering from your ham shack or other remote location.

All models without motor drives come standard with manual hand winches which have load actuated brakes for maximum safety. This feature prevents the winch from free-wheeling and causing injury to you or your installation in the event that you loose your grip during raising or lowering.

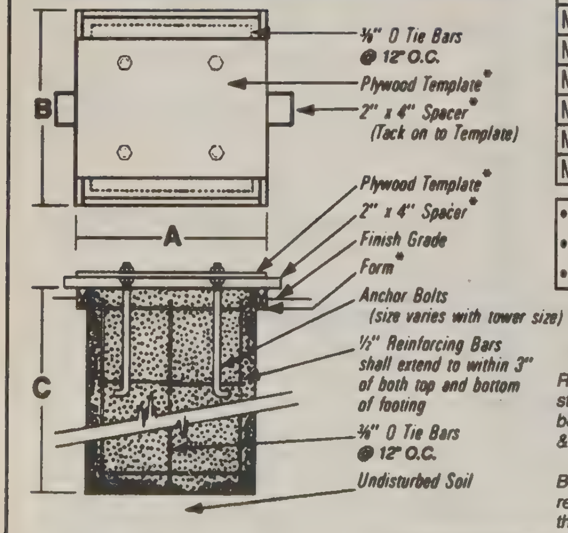
All steel used at US Tower conforms to ASTM specifications. All welding is done by certified factory personnel. All of our towers are factory tested by trained personnel before leaving the plant.



Model Number	Height Maximum	Height Minimum	Sections	Weight Pounds	Sec O.D. Top	Sec O.D. Bottom	HRO Price
MA-40	40'	21'6"	2	242	3" sq.	4.5"	$679.95
MA-550	55'	22'1"	3	435	3" sq.	6.625"	$1,069.95
MA-550MDP	55'	22'1"	3	620	3" sq.	6.625"	$2,619.95
MA-770	75'	22'10"	4	645	3" sq.	8.0"	$2,259.95
MA-770MDP	75'	22'10"	4	830	3" sq.	8.0"	$3,579.95
MA-850MDP	90'	23'6"	5	1128	3" sq.	10.0"	$4,819.95

All Towers will handle 10 sq. ft antenna at 50 MPH winds.

MA-SERIES BASE INFORMATION



*To be removed after base is installed.

Model	A	B	C	HRO Price
MA-40 standard flat base	16"	16"	16"	CALL
MA-550 standard flat base	20"	20"	20"	CALL
MARB-40 Rotor Base	3'	3'	4'	$499.95
MARB-550 Rotor Base	3'	3'	5'6"	$579.95
MARB-770 Rotor Base	3'	3'	6'6"	$689.95
MARB-850 Rotor Base	4'	4'	6'6"	$819.95

- Base dimensions may vary with different soil compositic
- Allow ample time for concrete to cure.
- MAB and MARB dimensions are the same.

Rebar is not provided by US Tower. MA-40 & 550 use their standard base as a template. These standard bases use only 2 bolts and require no rebar. Wooden template included with MAB & MARB bases.

Because of wide variations throughout the country in zoning requirements and loading conditions (snow, wind, ice, etc.), it is the responsibility of the customer to make Certain that his Tower conforms to all applicable codes. We recommend you obtain all necessary permits prior to purchase .

The factory reserves the right to make changes or modifications without notice.

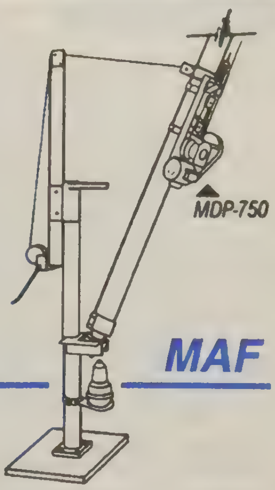
MA-SERIES ACCESSORIES

The Customer is Responsible
for obtaining all local city or county building and tower permits
AND
for taking the tower off the freight truck when it is delivered. Please arrange for adequate help.

MAF Raising Fixture

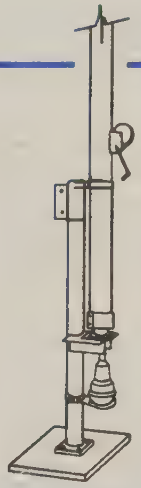
MAF-Series Raising Fixture accessory for easy raising and antenna servicing. For use with MARB and MAB bases.

Model	Description	Weight
MAF-40	Raising Fixture for MA-40	35#
MAF-550	Raising Fixture for MA-550	70#
MAF-770	Raising Fixture for MA-770	75#
MAF-850	Raising Fixture for MA-850	80#



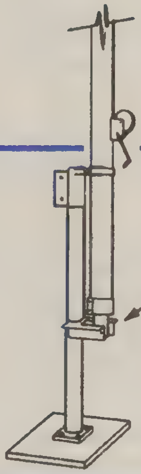
MARB Freestanding Rotator Base

Model	Description	Weight
MARB-40	Freestanding Rotator Base for MA-40 with four 3/4" x 27" anchor bolts and thrust bearing	75#
MARB-550	Freestanding Rotator Base for MA-550 with four 1" x 36" anchor bolts and thrust bearing	140#
MARB-770	Freestanding Rotator Base for MA-770 with four 1" x 36" anchor bolts and thrust bearing	195#
MARB-850	Freestanding Rotator Base for MA-850 with four 1-1/8" x 36" anchor bolts and thrust bearing	280#



MAB Freestanding Type Base

Model	Description	Weight
MAB-40	Freestanding hinged base for MA-40 with four 3/4" x 27" anchor bolts	55#
MAB-550	Freestanding hinged base for MA-550 with four 1" x 36" anchor bolts	119#
MAB-770	Freestanding hinged base for MA-770 with four 1" x 36" anchor bolts	175#
MAB-850	Freestanding hinged base for MA-850 with four 1-1/8" x 36" anchor bolts	180#



Hinging allows for easy installation on both MAB and MARB Bases.

Coax Standoff Arms

Model	Description	Weight
CX-2M	Coax Standooff arms for MA-40	4#
CX-3M	Coax standoff arms for MA-550	6#
CX-4M	Coax Standoff arms for MA-770	8#
CX-5M	Coax standoff arms for MA-850	10#
IV-16	The IV-16 slips over the top of the mast and rests at the top of the tower to hold inverted vee antennas. TheIV-16 cannot be used with the MARB rotator base.	5#

Call Toll-Free for Discounts on U.S. Towers and Accessories

Motor Drives

Model	Description	Weight
MD-75	Heavy-duty motor drive with one HP motor and gear box.	155#
MDP-750	Heavy-duty motor drive with one HP motor, gear bos, and positive pull down.	185#

Remote Control Accessories

Model	Description	Weight
RMC-1000	Relay operated remote control for raising and lowering your tower from your ham shack or other remote location.	18#
MCL-100	Limit switch control package includes limit switches, limit switch brackets, and control box at the base of the tower.	7#

US TOWER CORPORATION

TMM SERIES

***US Tower's** latest design includes the compact TMM Series towers giving Hams in restricted areas an alternative. The TMM Series has a minimum retracted height of 11'4" (may vary, depending on rotator used) and a maximum height of 47' including mast. At the towers' retracted height, visual impact is reduced to a minimum and antenna servicing is made easier. Typically the tower and antenna are below the roof line of your home when the tower is fully retracted.*

The TMM Series towers are lightweight, freestanding crank-up towers that allow up to 18 square feet of antenna in 50 mph winds per EIA specifications. The TMM-433HD handles 24 square feet.These lightweight towers should provide many years of trouble free service.All of our towers have a hot dipped galvanized finish inside and out.

The TMM-433SS and 541SS must have the rotator top mounted. The TM-433HD will accept the Alliance HD-73 and Telex Ham IV inside the tower. Oversized rotators will prevent full retraction of your tower; however, they may be used if full retraction is not required. This restriction is dependent on location of rotator plate. All TMM Series towers include anchor bolts, rotor plate, hinged T-base, load actuated winch, and eight feet of 2" OD x 120" antenna mast.

The TMM-433SS will accept the MD-75 motor drive accessory. The TMM-433HD and 541SS will accept the MD-75 and MDP-750 accessory motor drives. The MDP-750 motor drive accessory is compatible with both of our MCL-100 and RMC-1000 limit switch packages (see accessories).

TX SERIES

***US Tower's** freestanding TX Series crank-up towers are as strong or stronger than most competitors' heavy-duty models. The TX Series towers have 21 foot sections with 4 foot overlap to provide extra height and strength. In addition, the overlap helps prevent binding while lowering your tower in high wind and conditions.*

The TX Series towers have a large enough top section (12 1/2") to permit installation of most rotators inside the section for maximum strength while allowing the section to fully retract. Cross bracing at critical points on the tower ensures safety and additional strength. All US Towers crank-up towers have a heavy-duty, hot dipped galvanized finish both inside and out, which should provide many years of trouble free service.

The TX Series towers come complete with rotator plate and base hardware which includes, large steel anchor bolts and heavy-duty steel T-base that allows the tower to hinge on for easy installation. All T-bases will accept the TRX Series raising fixtures for easy one man installation. All TX Series towers include Fulton hand winches (except MDP and MDLP models) which feature automatic load actuated brakes for maximum safety. Masts and motor drives are available as accessories (see accessory page).

The TX-472MDP comes complete with MDP-750 motor drive and limit switch brackets. The TX-489MDPL includes the MDPL-1000 motor drive and limit switch brackets. Limit switch assemblies and remote raising devices are available (MCL-100) (RMC-1000) for all MDP-750 and MDPL-1000 motor drive units (see accessory page for description).

US Tower's TX Series requires no guying.The wind loading is calculated at 18 square feet of antenna in 50 mph winds per EIA specifications.To assist you in applying for necessary construction permits, Uniform Building Code calculations are available for most models.

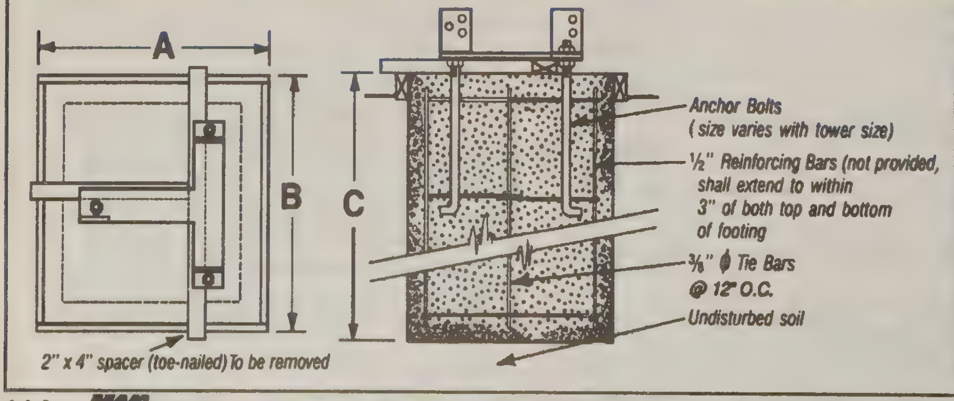
HDX SERIES

***US Tower's HDX Series** heavy-duty crank-up towers have up to 2 1/2 times more windloading capacity than others commonly advertised. This superior strength allows for large stacked arrays, while using our commercial type bases and anchor bolts that can be easily installed and vertically adjusted. All HDX Series T-bases are designed to use our TRX Series raising fixtures to make installations and antenna servicing a one man job.*

Modified top sections for the HDR-300 rotators are available at a small additional cost. US Tower carries as accessories many different sizes and strengths of masts which can be used with the HDX Series towers. The HDX-572MDPL and 589MDPL motorized towers provide dual level wind, positive pull down and heavy duty gear box features. The HDX-572MDPL comes only with limit switch brackets. The HDX-589MDPL comes complete with the MCL-100, limit switch package. All towers using MDP-750 and MDPL-1000 motor drives may use the RMC-1000 accessory limit switch package which allows the raising and lowering of your tower from the comfort of your ham shack or any remote location. MCL-100 is also available (see accessory page).

All HDX Series towers come complete with rotator plate, anchor bolts and heavy-duty T-base (doubles as template). US Tower's special T-base design allows the tower to hinge for easy installation. US Tower's crank towers do not require guy wires. The HDX Series towers are rated at 30 square feet of antenna at 50 mph winds per EIA specifications. To assist you in getting a construction permit, Uniform Building Code calculations are available for most towers.

CRANK-UP TOWER BASE INFORMATION


A
B
C
Anchor Bolts
(size varies with tower size)
½" Reinforcing Bars (not provided, shall extend to within 3" of both top and bottom of footing
⅜" ϕ Tie Bars @ 12" O.C.
Undisturbed soil
2" x 4" spacer (toe-nailed) To be removed

Model	A	B	C
TMM-433SS	3'	3'	4'
TMM-541SS	3'	3'	4'6"
TMM-433HD	3'	3'	5'4"
TX-438	3'	3'	5'
TX-455	3'	3'	6'3"
TX-472	4'	4'	7'
TX-489	4'	4'	7'
HDX-538	3'	3'	6'3"
HDX-555	4'	4'	6'6"
HDX-572	4'	4'	7'
HDX-589	5'	5'	7'6"
HDX-689	5'	5'	8'6"
HDX-5106	5'	5'	8'6"

SELF-SUPPORTING CRANK-UP TOWERS

Tower Specifications

COMPACT TMM-SERIES CRANK-UP TOWERS

Model Number	Height Maximum	Height Minimum	Sections	Weight Pounds	Sec O.D. Top	Sec O.D. Bottom	HRO Price
TMM-433SS	33' w/o Mas	11'4"	4	315	10"	18"	$1,049.95
TMM-433HD	33' w/o Mas	11'4"	4	400	12.5"	20 7/8"	$1,289.95
TMM-541SS	41' w/o Mas	12'	5	430	10"	20 7/8"	$1,389.95

All Towers will handle 18 sq. ft. antenna at 50 MPH winds. TMM-433HD will handle 24 sq. ft.

TX-SERIES FREE-STANDING CRANK-UP TOWERS

Model Number	Height Maximum	Height Minimum	Sections	Weight Pounds	Sec O.D. Top	Sec O.D. Bottom	HRO Price
TX-438	38'	21'6"	2	355	12.5"	15"	$999.95
TX-455	55'	21'	3	670	12.5"	18"	$1,499.95
TX-472	72'	22'8"	4	1040	12.5"	21 5/8"	$2,479.95
TX-472MDP	72'	22'8"	4	1210	12.5"	21 5/8"	$3,999.95
TX-489	89'	23'4"	5	1590	12.5"	25 5/8"	$4,299.95
TX-489MDPL	89'	23'4"	5	1800	12.5"	25 5/8"	$6,439.95

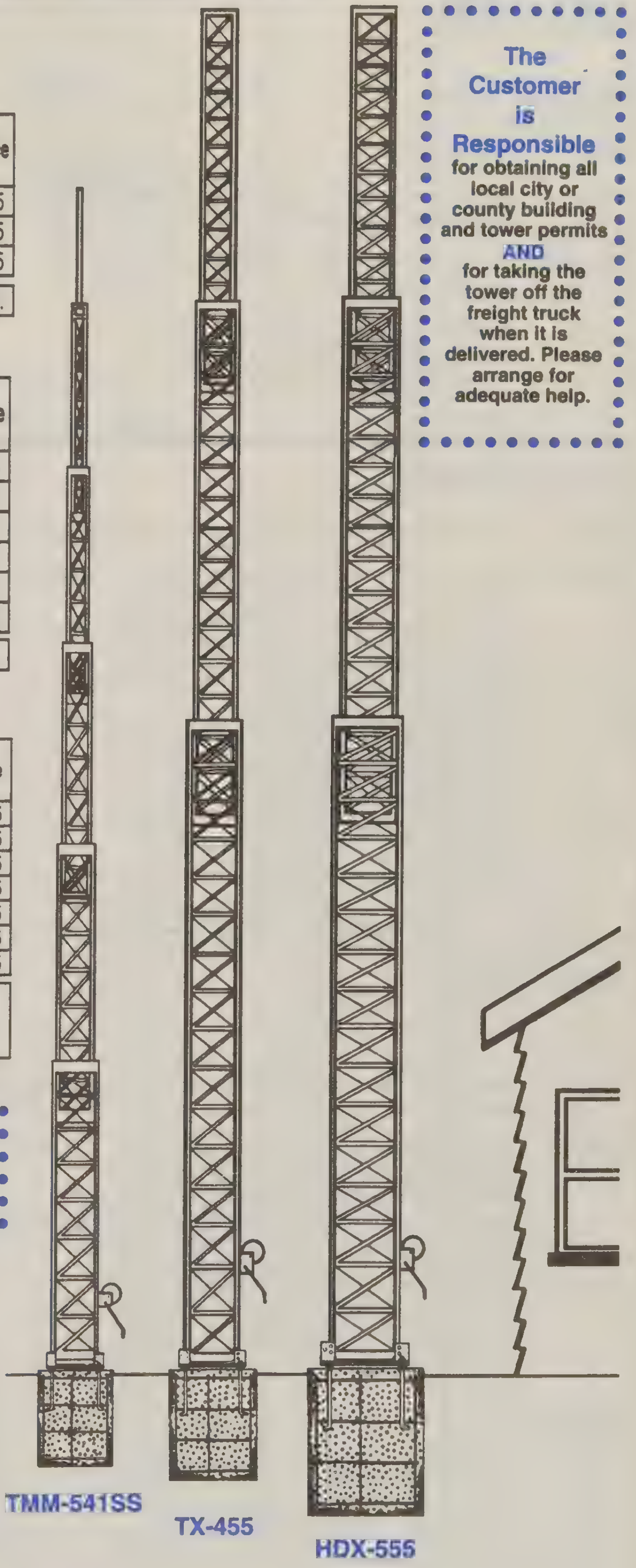
All Towers will handle 18 sq. ft. antenna at 50 MPH winds.

HDX-SERIES HEAVY-DUTY CRANK-UP TOWERS

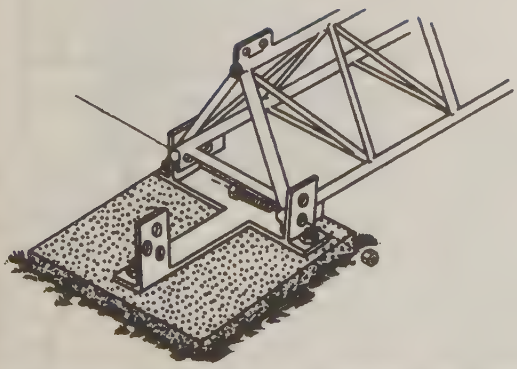
Model Number	Height Maximum	Height Minimum	Sections	Weight Pounds	Sec O.D. Top	Sec O.D. Bottom	HRO Price
HDX-538	38'	21'6"	2	600	15"	18"	$1,289.95
HDX-555	55'	22'	3	870	15"	21 5/8"	$2,279.95
HDX-572	72'	22'8"	4	1420	15"	25 5/8"	$3,869.95
HDX-572MDPL	72'	22'8"	4	1600	15"	25 5/8"	$5,929.95
HDX-589MDPL	89'	23'8"	5	2440	15"	30 5/8"	$7,729.95
HDX-689MDPL	89'	23'8"	5	3450	18"	37 1/8"	$15,029.95
HDX-5106MDPL	106'	24'8"	6	3700	15"	37 1/8"	$16,649.95

All Towers will handle 30 sq. ft. antenna at 50 MPH winds.
HDX-689MDPL rated at 60 sq. ft of antenna at 50 mph winds.
HDX-5106MDPL rated at 35 sq. ft. of antenna at 50 mph winds.

The Customer is Responsible for obtaining all local city or county building and tower permits AND for taking the tower off the freight truck when it is delivered. Please arrange for adequate help.

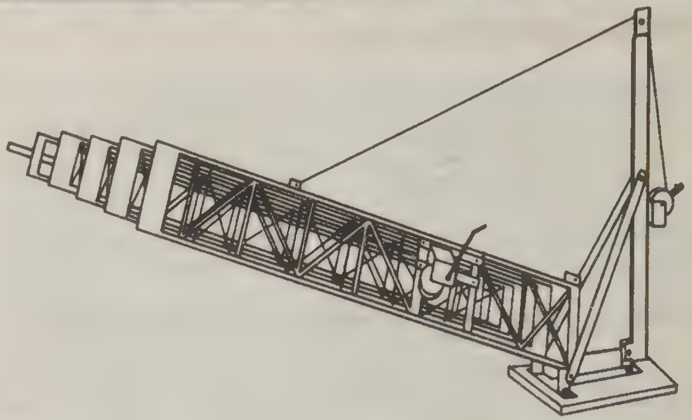


Call Toll-Free for Discounts on Towers and Accessories



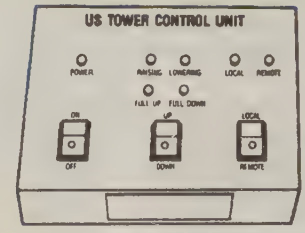
The factory reserves the right to make changes or modifications without notice.

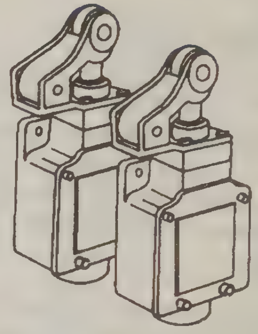
Raising Fixture



Model	Description	Weight
TRX-80	Standard model tower raising fixture for TMM, TX, and HDX series towers.	120#
TRX-80HD	Heavy-duty model tower raising fixture for TX and HDX series towers.	155#
	Both TRX-80 and 80HD are designed to be easily mounted on your tower's hinged T-base for quick and safe one-man installation or antenna servicing.	

Remote Control





Model	Description	Weight
RMC-1000	Relay operated remote control for raising and lowering your tower from your ham shack or other remote location. The RMC-1000 includes limit switches, limit switch brackets, and two relay boxes. The RMC-1000 can only be used with the MDP-750 and MDPL-1000 motor drives.	18#
MCL-100	Limit switch control package. The MCL-100 includes limit switches, limit switch brackets and control box at the base of the tower. The MCL-100 allows you to raise and lower your tower with automatic shut down when maximum or minimum height is reached. The MCL-100 can only be used with the MDP-750 and MDLP-1000 motor drives.	7#

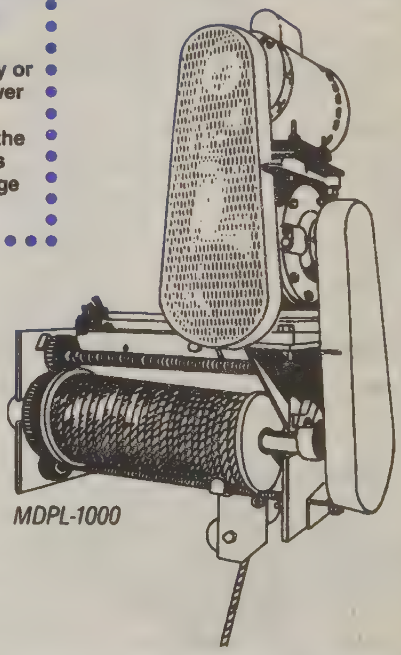
Motor Drives

Model	Description	Weight
MD-75	Heavy-duty motor drive with 1 HP motor and gear box.	155#
MDP-750	Heavy-duty motor drive with 1 HP motor, gear box and positive pull down. US Tower's positive pull down feature is designed to mechanically apply the same strength in the retraction process as is used in the raising of your tower. Positive pull down is very important in lowering your tower in high wind conditions. The MDP-750 differs fromthe standard motor drive (MD-75) unit which releases tension on the cables allowing the weight of the upper sections to be the only lowering force.	185#
MDLP-1000	Heavy-duty motor drive with 1 HP motor, heavy duty gear box, positive pull down and dual level wind features. Dual level wind is an exclusive US Tower design allowing the cable to wind on the motor drum in a uniform manner. This prevents the cable from overlapping on the drum. For description of positive pull down see MDP-750.	220#

The Customer is Responsible

for obtaining all local city or county building and tower permits AND for taking the tower off the freight truck when it is delivered. Please arrange for adequate help.

Call factory for replacement 1 HP motors, handwinches, limit switches, 3/16" x 7" x 19" and 1/4" x 7" x 19" aircraft cable, anchor bolts, belts, pulleys, sprockets, and modified bases. Tower dolly rentals are available. The factory reserves the right to make changes or modifications without notice.



MDPL-1000

CRANK-UP ACCESSORIES

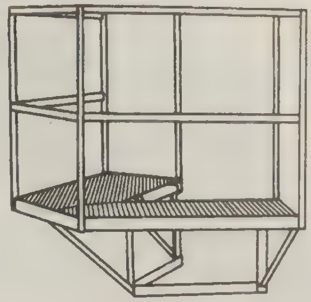
Model	Description	Weight

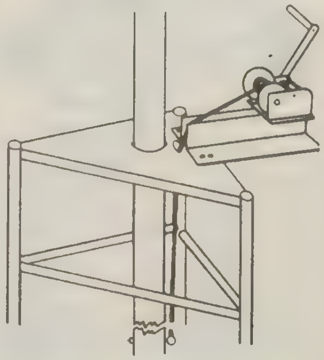
Service Platform

Model	Description	Weight
HDP	Large service platform with safety railings to provide a safe and comfortalbe surface while installing or maintaining your antenna and rotator.	125#

Mast Raising Fixture

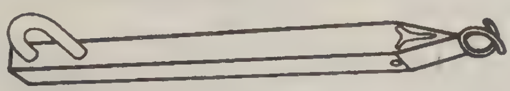
Model	Description	Weight
MRF	Mast raising fexture with winch and cable that attaches to the top of your tower to assist in raising and lowering your antenna mast.	20#





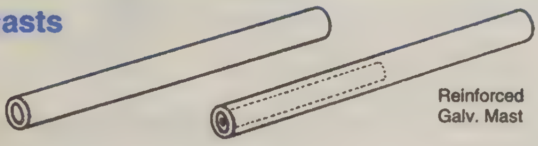
Coaxial Arm Sets

Model	Description	Weight
IV-16	The IV-16 slips over the top of the mast and rests at the top of the tower to hold inverted vee antennas. The IV-16 cannot be used with MARB rotator base.	5#



Model	Description	Weight
CX-2	Set of 2 Coax Standoff Arms	6#
CX-3	Set of 3 Coax Standoff Arms	8#
CX-4	Set of 4 Coax Standoff Arms	10#
CX-5	Set of 5 Coax Standoff Arms	13#

Masts

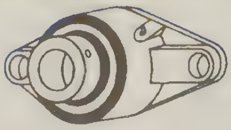


US Tower offers two different types of masts. The M-5, 10, 15 and 20 masts have .120" wall thickness. The M-15R and 20R have steel pipe inserts in the lower half of the mast which provides extra strength where most needed without adding unnecessary weight in the top portion. The M-15R and 20R have a wall thickness of .250".

Model	Description	Weight
M-5	2" O.D. x 5 foot Galv Mast	14#
M-10	2" O.D. x 10 foot Galv Mast	25#
M-15	2" O.D. x 15 foot Galv Mast	40#
M-15R	2" O.D. x 15 foot reinforced Galv Mast	50#
M-20	2" O.D. x 20 foot Galv Mast	55#
M-20R	2" O.D. x 20 foot reinforced Galv Mast	70#
CM-20	2" O.D. x 20 foot .375 wall thickness chromemolly steel	130#

Model	Description	Weight
3/4" x 27"	Anchor Bolt with 2 nuts	5#
1" x 36"	Anchor Bolt with 2 nuts	10#
1-1/8" x 27"	Anchor Bolt with 2 nuts	12#
RP-3	Rotator Plate for 10" section	5#
RP-4	Rotator Plate for 12.5" section	7#
RP-5	Rotator Plate for 15" section	9#

Thrust Bearing



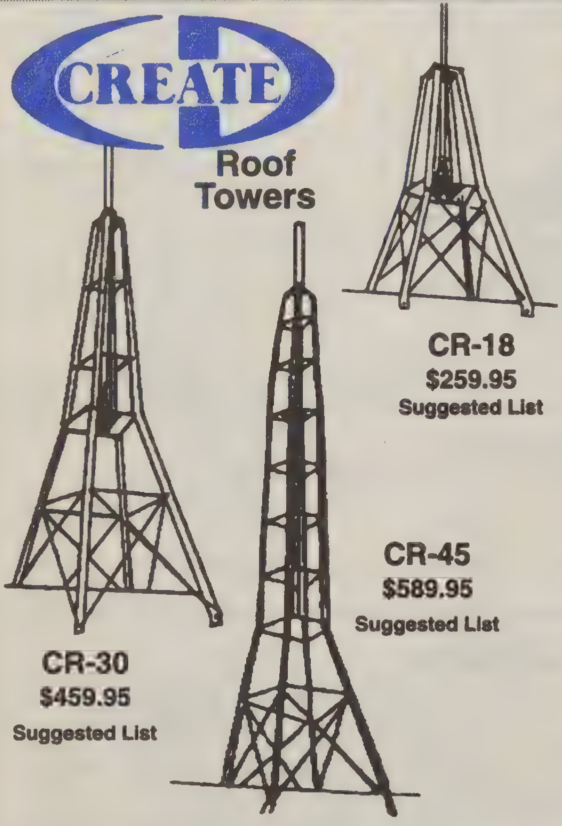
Model	Description	Weight
TB-2US	Thrust Bearing for 2" mast, 2 flange holes	10#

Tower Accessories

S - Standard
O - Optional

	TX-438	TX-455	TX-472	TX-472MDP	TX-489	TX-489MDPL	HDX-538	HDX-555	HDX-572	HDX-572MDPL	HDX-589MDPL	TMM-433SS	TMM-433HD	TMM-541SS	HRO Price
MASTS															
M-5	O	O	O	O	O	O	O	O	O	O	O	O	O	O	$36.00
M-8												S	S	S	CALL
M-10	O	O	O	O	O	O	O	O	O	O	O	O	O	O	$69.95
M-15	O	O	O	O	O	O	O	O	O	O	O	O	O	O	$92.95
M-20	O	O	O	O	O	O	O	O	O	O	O				$129.95
M-15R	O	O	O	O	O	O	O	O	O	O	O				$139.95
M-20R	O	O	O	O	O	O	O	O	O	O	O				$189.95
CM-20	O	O	O	O	O	O	O	O	O	O	O				$389.95
RAISING FIXTURE															
TRX-80	O	O					O	O				O	O	O	$389.95
TRX-80HD			O	O	O	O			O	O	O				$499.95
SERVICE PLATFORM															
HDP			O	O	O	O			O	O	O				$669.95
COAX STANOFF ARMS															
CX-2	O						O								$49.95
CX-3		O						O							$69.95
CX-4			O	O					O	O		O	O		$99.95
CX-5					O	O					O			O	$139.95
MOTOR DRIVES															
MD-75	O	O					O	O				O	O	O	$889.95
MDP-750		O	O	S				O					O	O	$1389.95
MDPL-1000			O		O	S			O		S				$1879.95
REMOTE CONTROL															
RMC-1000		O	O	O	O	O		O	O	O	O		O	O	$889.95
MCL-100		O	O	O	O	S		O	O	S	S		O	O	$379.95
MISCELLANEOUS															
3/4" X 27" bolts	S											S	S	S	$21.95
1" X 36" bolts		S			S	S	S		S	S					$28.95
1-1/8" X 36" bolts			S	S				S			S				$37.95
RP-3												S		S	$19.95
RP-4	S	S	S	S	S	S							S		$26.95
RP-5							S	S	S	S	S				$32.95
MRF	O	O	O	O	O	O	O	O	O	O	O		O		$249.95
TB-2US	O	O	O	O	O	O	O	O	O	O	O		O		$98.95
IV-16	O	O	O	O	O	O	O	O	O	O	O	O	O	O	$37.95

CREATE Roof Towers



CR-18
$259.95
Suggested List

CR-45
$589.95
Suggested List

CR-30
$459.95
Suggested List

Create Roof Towers are constructed of high grade aluminum with galvanized steel bracing for added stability and strength. The towers will easily accommodate your antenna requirements. The three sizes will support VHF antennas, HF tri-banders and OSCAR systems. Rotators easily mount inside the tower. An optional thrust bearing (Model #CK46) is recommended. Guying is required on all roof towers. Maximum mast size is 2.5".

Model	Height	Max Antenna Wind Load in FT2	Base Width	Max Vertical Load in lbs.	Tower Weight in lbs.
CR-18	5'10"	21 @ 90 MPH	31 1/3"	440	18
CR-30	9"10"	27 @ 90 MPH	39"	1322	33
CR-45	14'9"	23 @ 90 MPH	39"	881	57

Unarco-Rohn

25G & Accessories

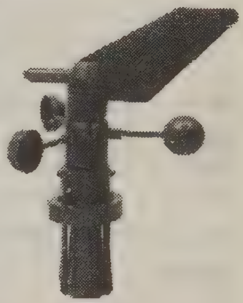
25G	10' tower section.
25AG2	Top secton for use with communication antenna. Mast support tube is 2 1/4" O.D., 36" total length, extending 18" above apex of side rails.
25AG4	8' top section for communication antenna. Upper end terminates in 11" diameter flat, circular plate with a 2 1/4" hole in center.
AS25G	Accessory shelf.
GA25GD	Guy assembly
SB25G	3'4" short base section for concrete.
SBH25G	3'4" hinged short base section for concrete.
BPC25G	Concrete base plate.
BPH25G	Hinged base plate for concrete.
HB25AG	Adjustable house bracket (0-15")
HB25BG	Adjustable house bracket (0-24")
HB25CG	Adjustable house bracket (0-36")
HBU	Universal house bracket (6-30").
TB3	Heavy-duty thrust bearing, recommended for 2" O.D. mast.
WP25G	Work platform.
EF2545	Aluminum erection fixture.

Other accessories available

Weather Station

ULTIMETER II

The Ultimeter II is the ideal home weather station. It can be used to provide data for SKYWARN and A.R.E.S. It is fully compatible with the Automatic Packet Reporting System. It is constructed with a patented, super reliable, all digital wind sensor. It clamps to a mast without hardware. There is nothing to rust or corode. The station features a unique point-and-plug direction calibration. An alarm tells you to crank down your tower when high winds threaten. More than 20 weather functions are provided. (Some functions require optional features.) **HRO Price $179.95**



Options: Rain Gauge $60.00
Additional keyboard/display $69.00
Data Logger for PC $69.00
RFI filter $17.00
Static Electricity Discharge Unit $17.00

Call Toll-Free and Check Out Our Low Discount Prices

hy-gain Towers

Model	Order Number	Sections	Height Extended ft (m)	Height Retracted ft (m)	Width at Base in (mm)	Wind Load Limit @ 50 mph #	Ship Wt lbs (kg)	Sugg. List Price
HG-37SS	129	2	37 (11.3)	20.5 (6.2)	13.75 (349.3)	9.5 (.8)	265 (120)	$1,638.95
HG-52SS	125-1	3	52 (15.8)	21 (6.4)	16.44 (417.6)	9.5 (.8)	455 (206)	$3,013.95
HG-54HD	130-1	3	54 (16.5)	21.5 (6.6)	19.53 (496.1)	16* (1.5)	575 (261)	$3,838.95
HG-70HD	131-1	4	70 (21.3)	21.5 (6.6)	22.63 (574.7)	16* (1.5)	1100 (499)	$5,918.95

* wind load rated at 60 mph # square feet (square meters)

General Information for Our Valued Customers

Easy Ordering

Six toll-free 800 numbers are available for orders. They are located throughout the United States. This provides personnel at one location or another to answer your questions for extended hours Monday through Saturday. You will find the same low prices at all locations and, thanks to computers, we have the stock levels of all locations available to each salesperson for estimates of availability and delivery.

Shipments are made from any of our 12 locations that has the particular items you need in stock. In most cases, the shipment will be made from the location nearest you (if stock is available). HRO is trying to provide the quickest shipments in the industry using these methods.

California customers can now order using a toll-free number. The number is 1-800-854-6046. It is no longer necessary for California customers to pay for the phone call.

Sales Tax

State and Local laws require us to collect and remit State sales / use tax on orders shipped from any of our 12 locations INTO Arizona, California, Colorado, Georgia, or Virginia.

You will find that this small extra charge will be more than overcome by the convenience of the largest ham radio inventories in the United States. You will also find courteous and knowledgeable salespeople to assist you. We think you will find HRO to be the company you want backing you when it comes to dealing with any problems you might have with manufacturers or shipping companies.

Phone Orders

To place a phone order using a credit card, please have the following information available if you are a first-time caller or have not made a recent purchase from HRO. We will ask for your callsign (if any), credit card number, expiration date, your home telephone number, and possibly the name, address, and telephone number of the bank listed on your charge card statement.

Payment

We accept Visa, MasterCard and Discover Card. Personal checks are also accepted; however, processing time will delay shipment by some 10 days. When using a credit card, please have the card in front of you since we will need all the information, including the name of the issuing bank. If the card holder's BILLING address differs from the shipping address, please be sure to specify both addresses and telephone numbers. For your protection, we thoroughly investigate the validity of all credit card purchases.

COD Orders

COD payments must be made in cash, cashiers check, or money order at the time of delivery. There is a small fee for COD shipments.

Commercial Sales Purchase Orders

Written purchase orders will be accepted from city, state, and federal agencies, and, with prior approval of credit, from commercial organizations. HRO quotes, in most cases, prices that require payment on receipt of merchandise. You may find a surcharge for credit terms applied to your pricing. Please indicate that you require terms when calling for price quotes.

Thank You for choosing

HAM RADIO OUTLET®

The World's Largest
Ham Outlet

Delivery

All Alaska and Hawaii shipments via UPS must be shipped by Blue Label (2nd Day Air) or Red Label (Overnight). Please ask for charges.

In a Hurry? If you find it necessary to expedite shipments, UPS has Red Label (overnight) , Blue Label (2nd-day) and Orange Label (3 day) services available at an extra cost. Please request charges for these services.

Foreign Deliveries We ship world-wide. Contact our stores, preferably by fax with your needs. We can quote you and give you details for placing your foreign order. Payment methods include wire transfer direct to our bank as well as payment by VISA/ MC Charge Cards or check drawn in U.S. Funds from a U.S. Bank. Shipments are made (depending on size) by UPS, FED EX, Emery, DHL, or international air mail. Some orders to some foreign countries cannot be insured to the full value.

Truck Delivery On day of delivery, if by truck, please be sure to have enough help, and / or proper equipment on hand for unloading merchandise. Truck drivers are NOT required to provide assistance. If you are not experienced at handling large, awkward items such as towers, antennas or amplifiers, please ask properly trained people to assist you.

Canadian Orders can now be shipped via UPS. These costs will be added to your invoice.

Damaged Items

UPS If the item is obviously damaged, note this with the driver and refuse shipment. This item will be returned to HRO and another will be sent at no additional charge.

If hidden damage is noted, contact UPS as soon as possible. They will arrange pickup. Once the item is received by HRO, a replacement will be sent.

TRUCK If there is damage or the shipment is short, it is the customer's responsibility to file the claim with the trucking company. At the time of receipt of item, it is recommended that you have the driver write "damaged" or indicate shortage on the bill of lading he gives to you. Be sure to have the same notation as well as drivers signature on his copy also.

MAIL It is the customer's responsibility to file all loss or damage claims with the postal department.

Prices

Most prices shown are suggested list price. In most cases we offer large discounts. Equipment manufacturers constantly change prices, offer specials or react to the Dollar/Yen exchange rates. Simply call one of our 800 numbers and our staff will be happy to quote you the current selling price of the item you are interested in. Prices are subject to change without notice or obligation to the customer.

Software

Software is sold on a non-returnable basis. Any software problems will be resolved under the terms of the manufacturer's warranty.

Lost Items

When your order is delivered, please carefully count items and if anything is missing, notify HRO at once.

Occasionally, cartons shipped at the same time will arrive at their destination two or three days apart.

If you notify HRO within 10 days, we will replace lost or damaged items after completion of proper documentation and acceptance by the shipping agency.

New Equipment Returns

Products are not sold for evaluation. Under some circumstances (at the discretion of HRO) and with prior approval of the store of purchase, HRO will accept an item for return. Under most circumstances a 15% restocking fee and all freight charges will be assessed.

Your means of refund for returns will be the same as that used for your original payment except for cash, which will be refunded by check. HRO will make payment from its corporate offices and this can take up to two weeks.

Manufacturer's New Equipment Warranties

Ham Radio Outlet supports all manufacturers' warranties. Actual warranty terms are included with most items within the shipping container. If needed, you may request from any of our locations a free manufacturer's copy of the written terms for any specific warranteed product. Please request by model number and indicate the page in this catalog that represents the product.

Ham Radio Outlet will in many cases provide in-store repairs; please contact the store of purchase for information. It will be necessary to provide us with the invoice number and purchase date, as most manufacturers need this information to process under their FREE warranty repair terms.

New Equipment Warranty Returns

When returning equipment for repair, please pack the item in original packing material or something similar to provide adequate protection during the shipping process. Note on box: "ATTENTION SERVICE." Include a copy of your purchase invoice, and a complete and detailed description of the problems. Without the invoice or a complete description, delays will be experienced in providing the proper service and returning the item to you. Be sure to insure the package for its replacement cost.

HRO will repair or replace the defective item at our option. If the item is found to be defective under the terms of the manufacturer's warranty, no charge will be made for service or return shipping.

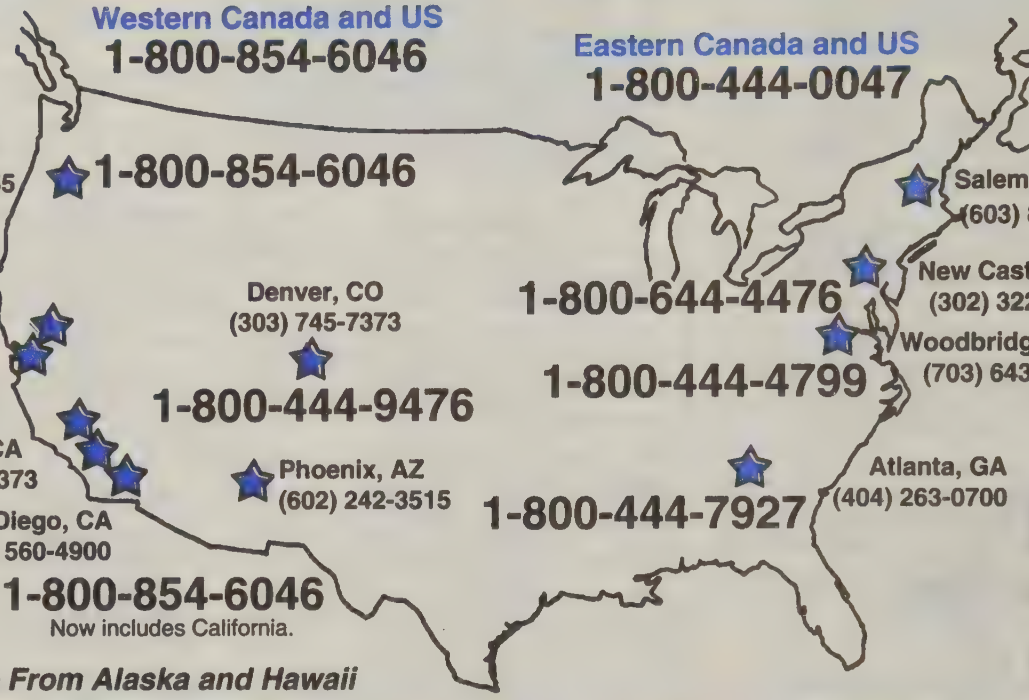
It is the customer's responsibility to ship all defective items to the service center for warranty repair.

Problems

HRO prides itself in its ability to service the customer. If there is a problem please contact the manager of the store from which you purchased the merchandise. If for some reason, your problem cannot be corrected by that store manager, please feel free to call Ham Radio Outlet Corporate Headquarters at (510) 831-1771 and explain the situation. At this point our national sales staff will see that your problem is corrected.

HAM RADIO OUTLET

Serving You From Coast to Coast and Around the World



Western Canada and US
1-800-854-6046

Eastern Canada and US
1-800-444-0047

Portland, OR
(503) 598-0555
1-800-854-6046

Oakland, CA
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Sunnyvale, CA
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Van Nuys, CA
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Anaheim, CA
(714) 533-7373

San Diego, CA
(619) 560-4900

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Now includes California.

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1-800-444-9476

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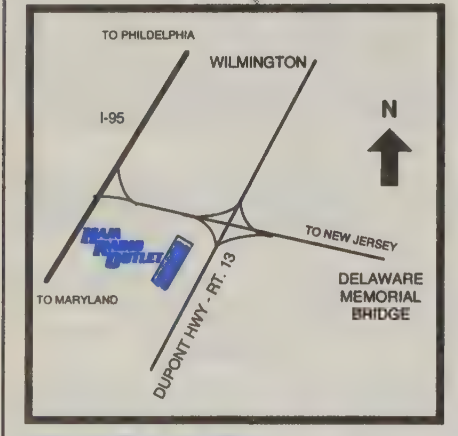
Phone Hours: 9:30 AM to 5:30 PM Monday - Saturday

24-Hour FAX Order Lines: At All 12 Locations

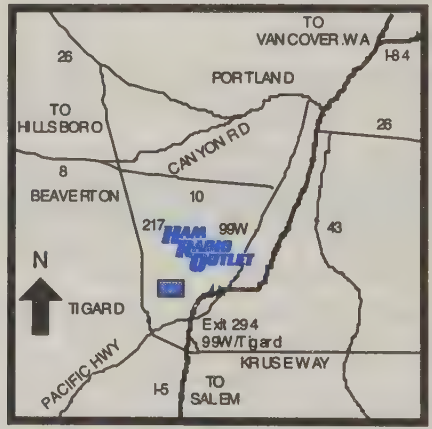
12 Locations!

HRO Now In New Castle, Delaware


TO PHILDELPHIA
WILMINGTON
I-95
N
HAM RADIO OUTLET
TO NEW JERSEY
TO MARYLAND
DUPONT HWY - RT. 13
DELAWARE MEMORIAL BRIDGE

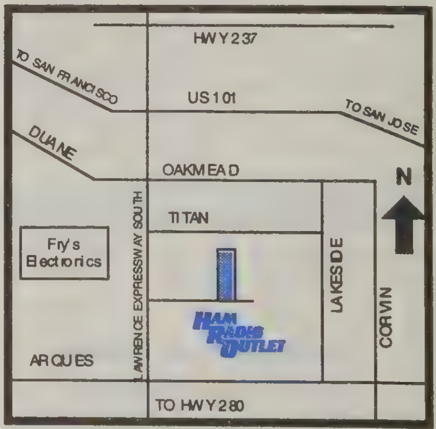
NEW CASTLE, DE 19720
1509 N. Dupont Hwy
(302) 322-7092
(800) 644-4476
24 Hour Fax (302) 322-8808

Jim K3QIO **Mgr**
Jimmy KA3LLL
Kent KD1IJ
Bob WN3K
Duane


TO VANCOVER WA
I-84
26
PORTLAND
TO HILLSBORO
26
CANYON RD
8
BEAVERTON
10
217
99W
HAM RADIO OUTLET
43
N
TIGARD
Exit 294 99W/Tigard
KRUSE WAY
PACIFIC HWY
I-5
TO SALEM

PORTLAND, OR 97223
11705 S.W. Pacific Hwy (99W)
(503) 598-0555
(800) 854-6046
24 Hour FAX (503) 684-0469

Earl KE7OA **Mgr**
Jack KG7LX
Ray KI7TN
Bill N7RYW


HWY 237
TO SAN FRANCISCO
US 101
TO SAN JOSE
DUANE
OAKMEAD
N
TITAN
Fry's Electronics
LAWRENCE EXPRESSWAY SOUTH
LAKESIDE
CORVIN
HAM RADIO OUTLET
ARQUES
TO HWY 280

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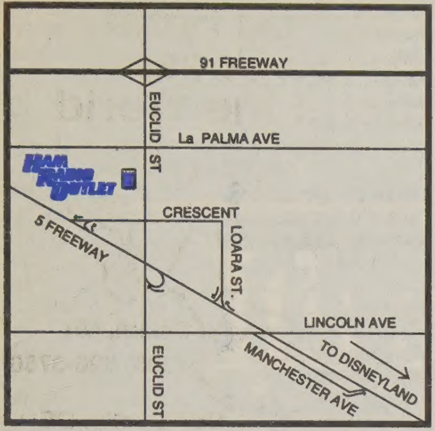
Jim KM6PI, Steve N6MSQ
Steven N6SMR

All Stores Open 10am - 5:30pm Monday - Saturday

STORE LOCATIONS


91 FREEWAY
EUCLID ST
La PALMA AVE
HAM RADIO OUTLET
CRESCENT
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LOARA ST.
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TO DISNEYLAND
MANCHESTER AVE
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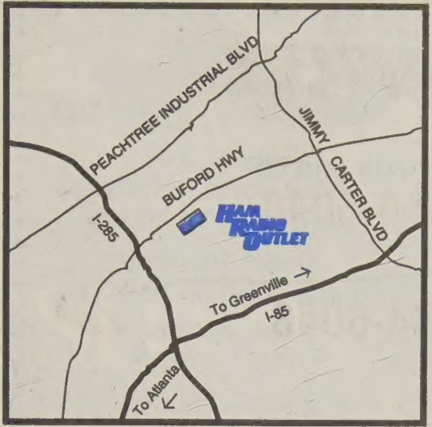
PEACHTREE INDUSTRIAL BLVD
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I-285
To Greenville →
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Bill KF8AZ,Don AC4VJ
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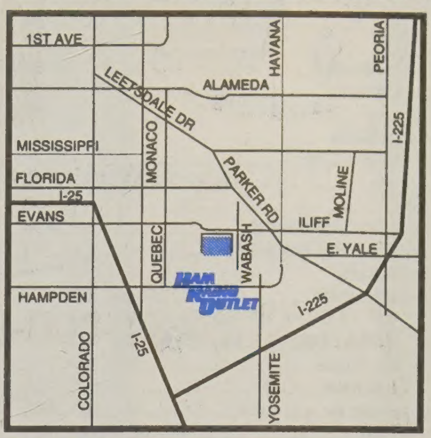
Dennis KD4VHS


1ST AVE
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ALAMEDA
I-225
MISSISSIPPI
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FLORIDA
PARKER RD
MOLINE
I-25
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ILIFF
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24 Hour FAX (303) 745-7394

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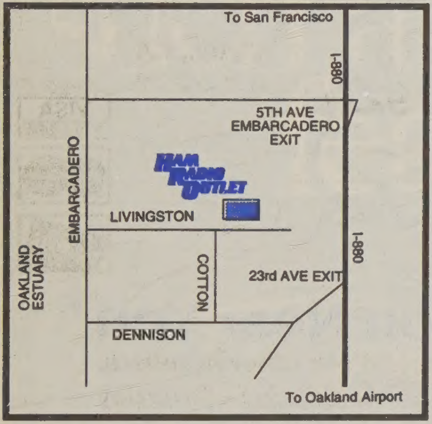
To San Francisco
I-880
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EMBARCADERO
HAM RADIO OUTLET
LIVINGSTON
I-880
OAKLAND ESTUARY
COTTON
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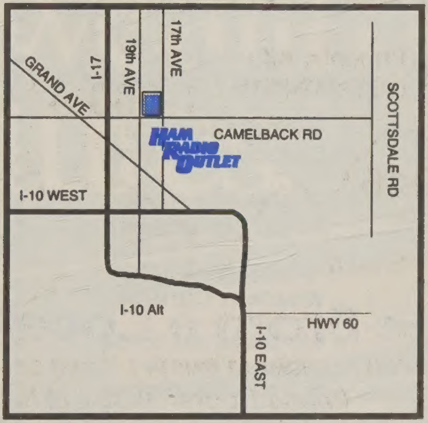
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19th AVE
17th AVE
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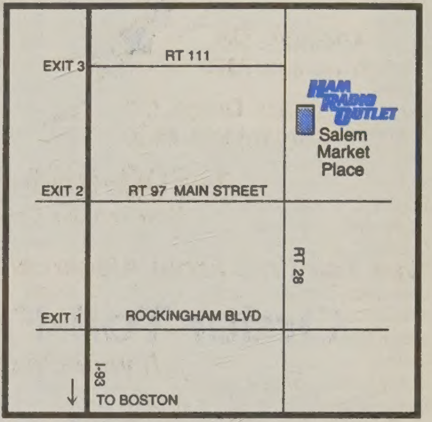
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RT 111
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Salem Market Place
EXIT 2
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RT 28
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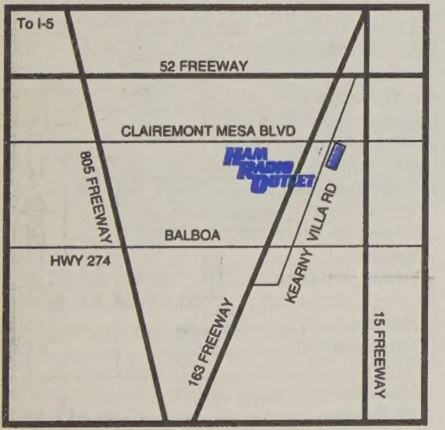
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CLAIREMONT MESA BLVD
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BALBOA
HWY 274
163 FREEWAY
15 FREEWAY

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Hwy. 163 & Clairemont Mesa Blvd

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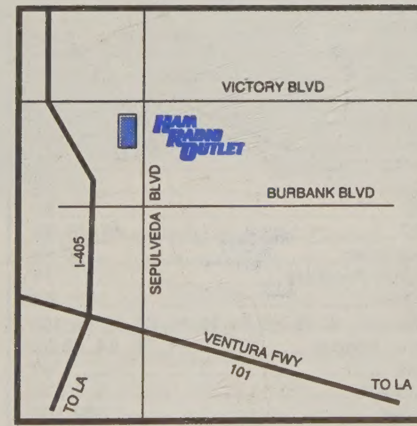
Mike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HAM RADIO OUTLET
BURBANK BLVD
I-405
SEPULVEDA BLVD
VENTURA FWY
101
TO LA
TO LA

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San Diego Fwy. at Victory Blvd

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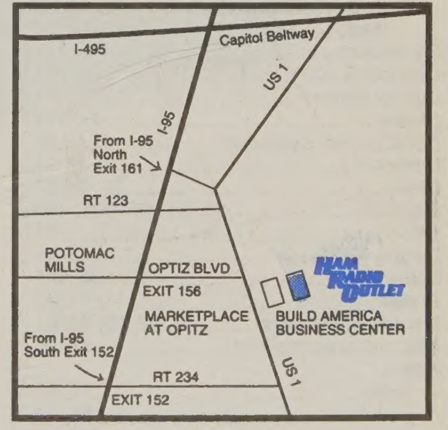
Skip KJ6Y
Dave N6HGA
Debbie N6UOM
Bruno KC6WGR


I-495
Capitol Beltway
US 1
I-95
From I-95 North Exit 161
RT 123
POTOMAC MILLS
OPTIZ BLVD
EXIT 156
HAM RADIO OUTLET
MARKETPLACE AT OPITZ
BUILD AMERICA BUSINESS CENTER
From I-95 South Exit 152
RT 234
US 1
EXIT 152

WOODBRIDGE, VA 22191

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(703) 643-1063
(800) 444-4799
24 Hour FAX (703) 494-3679
Exit 161, I-95 South to US 1

Curtis WB4KZL **Mgr**
Jerry WA2VGV
Lou KC4HR
Mike KA3TMQ, John N4LJS
Tami

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Northeast

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Mid-Atlantic / Mid-West

1-800-444-7927
Southeast / Mid-West

1-800-444-9476
Mountain / Central

1-800-854-6046
West / Northwest

1-800-854-6046
Western Canada

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Is Busy, Please Call
One of our Other Numbers.

24-Hour FAX Order Lines:
See pages 120 & 121

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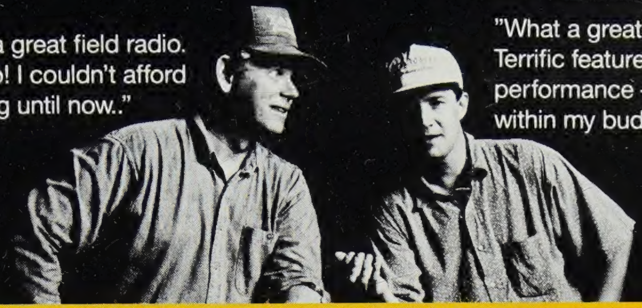

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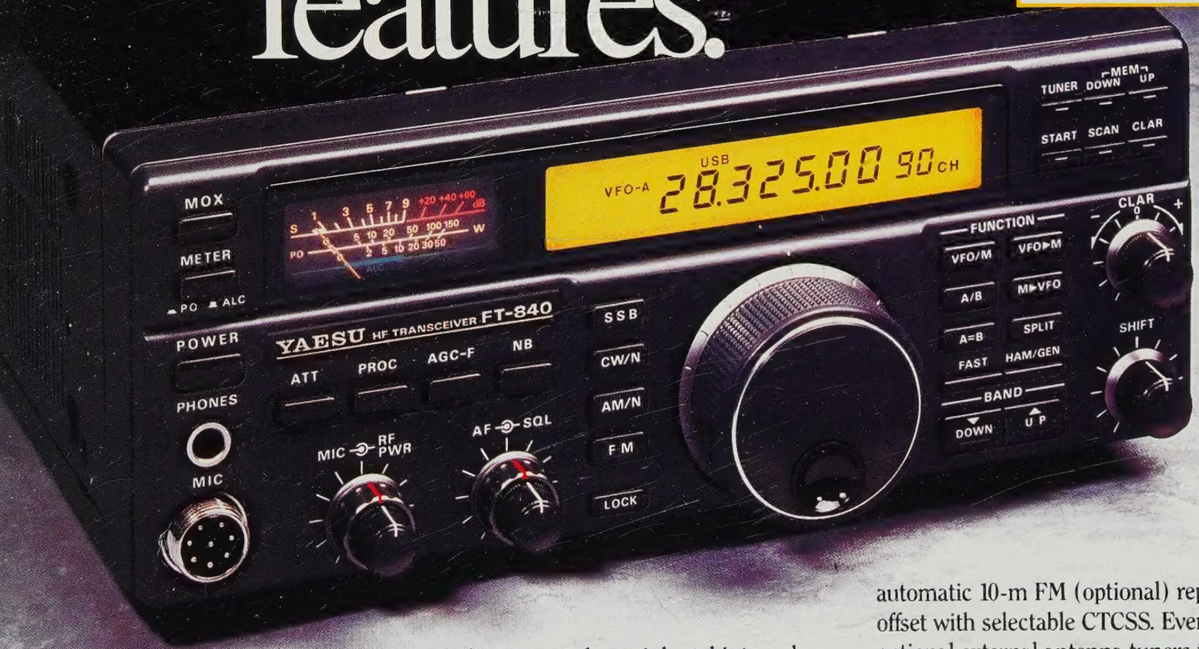

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